

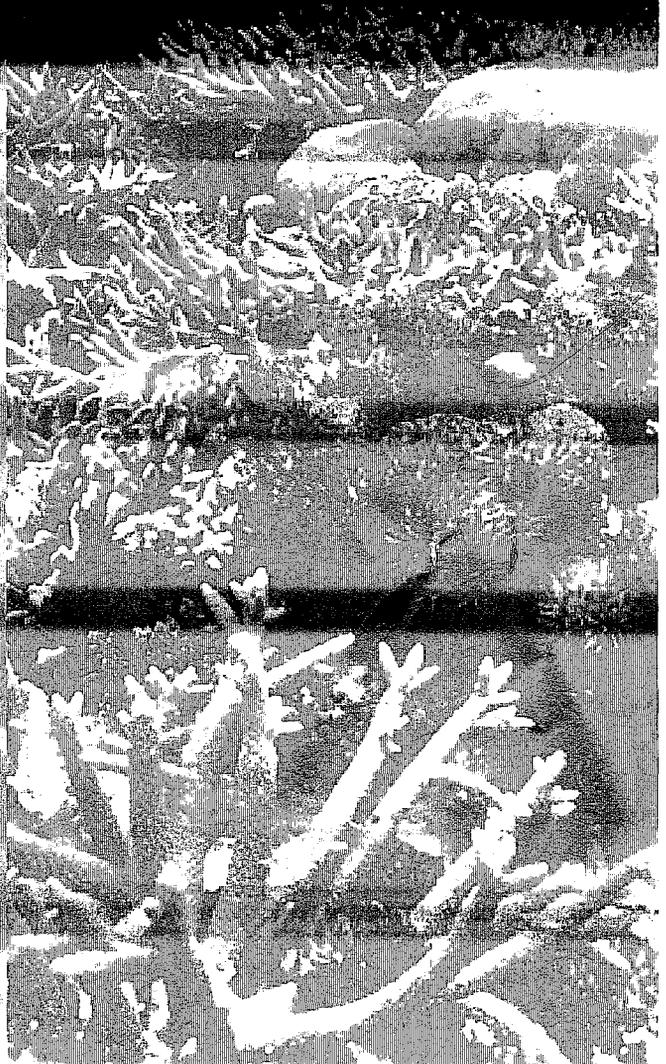
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**GreenCOM**  
Third Annual  
Technical  
Advisory  
Group Meeting

**Summary Report**

**February 6-7, 1997**



PN-ACB-177

# **Technical Advisory Group Meeting Summary Report**

**An Applied Research Agenda for GreenCOM,  
the Environmental Education and Communication Project**

**February 6-7, 1997**

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## EXECUTIVE SUMMARY

The 1997 Technical Advisory Group (TAG) meeting of the Environmental Education and Communication (GreenCOM) Project was held on February 6 and 7, 1997 at the Academy for Educational Development in Washington, D.C. This report provides a brief overview of the presentations made by the GreenCOM team describing the applied research activities either completed or initiated by the project subsequent to the previous TAG meeting held in November 1995. The report further attempts to draw unifying themes and recommendations from the discussions and consultation sessions surrounding the diverse research activities highlighted at the meeting. A copy of the meeting agenda is provided in Annex A.

The purpose of the annual TAG Meeting is to review GreenCOM's applied research activities and provide guidance on the development of its future applied research agenda and the dissemination of lessons learned. The meetings further assist the project in achieving its goals within the strategic framework of the U.S. Agency for International Development's (USAID) Center for Environment, the Center for Human Capacity Development and the Office of Women in Development.

TAG members, GreenCOM staff, USAID project officers and guests attended the meeting. The invited participant list is included in Annex B.

TAG members were asked for their input regarding:

- ▶ a peer review of the research issues addressed and methods used in both formative and evaluative research activities completed by the project since November '95;
- ▶ recommendations regarding activities currently underway in Nicaragua, the Philippines and El Salvador;
- ▶ suggestions pertaining to the direction of GreenCOM's future applied research agenda.

Regarding El Salvador, TAG members suggested that GreenCOM should try to evaluate activities to be implemented during the remaining year of project activities. Comparisons may be possible evaluating the impact of the new environmental curriculum at the beginning and at the end of the school year. Other comparisons to consider include comparing data from El Salvador to data gathered somewhere else in the region with comparable problems but where the GreenCOM supported interventions would be absent. Retrospective analysis of the improvement delivery systems have been through since project inception are also possibilities.

Regarding Nicaragua, TAG recommendations can be grouped into three categories: 1) looking for alternative livelihoods for the residents in the buffer zone communities of the La Flor Wildrefuge that are environmentally friendly (e.g., eco-tourism); 2) obtaining more biological information on aspects such as hatching rates and on socio-economic information to better

understand the dependence of buffer zone communities on natural resources in order to plan future educational interventions; and 3) developing a focused intervention with appropriate indicators to measure success given the short duration of the GreenCOM support activities.

Regarding The Philippines, the TAG members suggested obtaining support for environmental educational efforts from advocates (e.g., private sector, the church and the media), and focusing those efforts on specific behaviors as promoting that being environmentally friendly is good may be insufficient to have environmental impact. In addition, the behaviors to be included in messages may be enabling institutional or contributing behaviors. That is, people who do not engage in practices that can have a direct environmental impact can engage in behaviors leading towards that.

Highlights of the applied research recommendations provided by the TAG members to GreenCOM are provided in the section of the report entitled "Consulting the Oracle." In synthesis, these recommendations propose that:

- ▶ Participatory activities implemented by GreenCOM be evaluated. The evaluation should shed light on: the contextual conditions before and after the project that are necessary for a participatory activity to be successful; the interest and motivation individuals involved in a participatory exercise have in being involved in it; what key players must be involved in a participatory exercise for it to be successful and how they are identified; what needs to happen after people sit at the table to have a successful participatory experience; how much participation is enough, and what is the right balance between process and technical inputs.
- ▶ Environmental behavior may be both collective and individual. Concepts and constructs from systems theory, group theory, organization dynamics must be identified, applied and incorporated into project design. For interventions targeting individual behavior change, messages telling audiences that the environment is important are not enough. Specific behaviors individuals and communities need adopt have to be suggested. Normative messages may be powerful tools to generate behavior change. Campaigns that provide information about what others are doing through poll reporting or testimonials may be powerful tools of change.
- ▶ Small scale interventions may be justifiable because of impact and replicability.
- ▶ EE&C interventions need to be evaluated taking into account their content and duration. They should not be evaluated using long-term evaluation criteria, particularly those that link behavior change to environmental changes. In the context of relatively short GreenCOM projects, it is not possible to measure long-term environmental change. Therefore, appropriate outcome indicators for short-lived environmental education and communication (EE&C) interventions should be identified. These may include changes in attitudes, beliefs and behaviors targeted by those interventions. With the current re-

engineering of USAID and the focus on results it may be appropriate to fight for evaluation dollars often absent in previous GreenCOM Delivery Orders. Evaluation funds should be used to assess the commonality of projects, making sense of how people understand environmental problems and move toward change. The development of a meta-analytic framework across projects would represent a significant breakthrough in the field of EE&C.

- ▶ The environmental field is hungry for analysis of the social side of environmental issues. GreenCOM must adopt an aggressive dissemination strategy. When disseminating findings, GreenCOM should stress the commonalities across projects and search the literature for interventions funded by the international donor community to draw lessons across interventions and funding agencies. Try to disseminate lessons learned to users.

## BACKGROUND

GreenCOM is the United States Agency for International Development's (USAID) Environmental Education and Communication (EE&C) Project. Initiated in October 1993, GreenCOM has a five-to-seven year contract with USAID's Bureau for Global Programs, Field Support and Research. The Technical Advisory Group (TAG) meetings assist the project in achieving its goals within the strategic framework of the U.S. Agency for International Development's (USAID) Center for Environment to ensure GreenCOM's applied research activities constitute a valuable contribution to efforts to promote sustainable living resources, sustainable energy use, and sustainable cities. Other USAID objectives addressed by GreenCOM include improving basic education and embedding gender analysis within each project activity.

GreenCOM has worked with USAID missions, bureaus and host countries to address a wide range of environmental concerns, from municipal solid waste disposal, water and biodiversity conservation, to community management of forest and coastal resources, environmental policy formulation, training, and advocacy. Presently, environmental education and communication (EE&C) activities have been completed, or are now being carried out by GreenCOM, in 24 countries with future expansion planned. Four of these are "emphasis" countries: El Salvador, Egypt, the Gambia, and the Philippines. To date, GreenCOM's applied research activities across these countries include formative (operations) research studies and impact evaluation studies. Gender analysis, or the exploration of differential roles, views and/or effects of an intervention by gender, is an integral component of each project activity.

The third annual TAG meeting of the GreenCOM Project was held on February 6 and 7, 1997, at the offices of the Academy for Educational Development in Washington, D.C. The purpose of the annual TAG meeting is to review and critique applied research activities completed by GreenCOM during the past year and provide expert recommendations regarding the project's future applied research agenda.

The TAG members are a voluntary advisory group of professionals and academicians who are recognized experts from a wide range of fields and who bring a diverse set of skills and experience to bear upon the field of Environmental Education and Communication. In attendance at the meeting were: John Baldwin, Martin Fishbein, Lynne Hale, Robert Hornick, Paul Nowak, Tiahoge Ruge, and Thomas Zosel. Brief biographies of each TAG member are provided in Annex C.

The primary objectives of the 1997 TAG Meeting were to:

- ▶ Familiarize TAG members with applied research activities conducted by GreenCOM since the second TAG meeting convened on November 3 and 4, 1995;
- ▶ Conduct a peer review of the research issues addressed and methods used in both formative and evaluative research activities completed by the project;

- ▶ Seek recommendations by TAG members regarding activities currently underway in Nicaragua, the Philippines and El Salvador;
- ▶ Invite suggestions from TAG members regarding the direction of GreenCOM's future applied research agenda.

GreenCOM will use the recommendations provided by TAG members to improve the design and emphases of its applied research activities. TAG members' input will further assist GreenCOM in identifying which methods and tools used by the project thus far have the potential to contribute the most to the field of EE&C, and should thus be the focus of dissemination efforts.

This report first briefly summarizes introductory remarks made at the meeting and then focuses on the discussions held, including common themes that emerged across activities and program-specific recommendations that were offered by TAG members. For detailed descriptions of each of the research activities presented at the meeting by GreenCOM staff, see Annex D.

## MEETING INTRODUCTION

### Opening Remarks

Stephen Moseley, President of the Academy for Educational Development, gave a brief welcoming speech. Additional opening remarks were made by Emily Vargas-Baron, Deputy Assistant Administrator, Center for Human Capacity Development of USAID and William Sugrue, Deputy Assistant Administrator, Center for Environment of USAID.

Emily Vargas-Baron described GreenCOM as one of the strongest intersectoral projects at USAID, supported by both the Human Capacity Development Center and the Environment Center. Emily challenged GreenCOM to look for areas in which the project has achieved not only a success, but a breakthrough in the field of Environmental Education and Communication, and to aggressively disseminate these lessons learned. To foster synergy in the dissemination process, GreenCOM should seek collaboration with other partners, such as LearnLink. Some of the most important lessons that can be drawn are those that have implications for policy planning, especially pertaining to Basic Education. Emily also mentioned the importance of identifying indicators that can be used to measure the short, medium, and long-term impacts of EE&C interventions.

Bill Sugrue asserted that important policy change happens through citizen action and struggle, arising from an awareness of the existence of indignity and injustice, as embodied by the American Civil Rights movement. Public policy change comes through widespread public support combined with changes at the top of the power structure to enable the sharing of power. GreenCOM is working with citizens, NGOs, "real people" to facilitate policy change around a number of environmental issues.

### Purpose of the 1997 TAG Meeting

*Presenter: Kate Barba, USAID GreenCOM Project Officer*

Kate explained that the TAG Meeting is held annually to obtain vital input on GreenCOM applied research activities from the TAG Members, experts in diverse disciplines. The TAG should assist GreenCOM by examining the project's field activities, and providing input on research design and the project's evolving approach, both conceptual and procedural, to carrying out EE&C activities. Kate further noted that the growing need to measure the impact of interventions is unfortunately paralleled by the increasing difficulty of obtaining funding to carry out evaluative activities.

## **GreenCOM's Unique Contribution to USAID's Strategic Objectives: Lessons Learned**

*Presenter: Brian Day, GreenCOM Project Director*

Brian avowed that GreenCOM makes the critical difference in the success of environmental projects by adding the human dimension to projects using EE&C methods. GreenCOM gets people who are affected by an issue involved -- by asking, listening, observing, and doing. The overarching theme of this year's TAG Meeting, moving "beyond just listening to people," captures this approach: the need to involve local stakeholders in all aspects project planning, implementation and evaluation. GreenCOM's research capacity further provides the opportunity to develop and monitor indicators of success, measure the impact of an intervention to document real results, and assist missions in meeting their strategic objectives with measurable results.

## **Cross-Cutting Issues for GreenCOM Research: An Overview**

*Presenter: Susan Middlestadt, GreenCOM Senior Research Advisor*

Susan introduced the presentations to be given by members of the GreenCOM team as brief summaries of completed and ongoing research activities that illustrate the value of moving beyond just listening to people when designing programs. The activities described address USAID's Center for the Environment strategic objectives in four critical areas: Biodiversity; Policy and Public Awareness; Sustainable Urbanization; and Water Conservation.

GreenCOM is struggling with, and would like input on the importance and necessary degree of, stakeholder participation and involvement in formative research, project planning, implementation and evaluation. Consequently, this TAG is organized around two cross-cutting issues to facilitate discussion:

- ▶ participation in project planning; and
- ▶ participation in research.

In addition, TAG members will be asked to provide specific recommendations regarding applied research activities currently being planned or carried out in Nicaragua and El Salvador, and to provide input into the national environmental communication strategy being developed in The Philippines.

Summaries of each of the research activities presented at the meeting are included in Annex D.

The "oracle," or the TAG members, provided a number of useful recommendations pertaining to specific GreenCOM programs as well as across program boundaries. These recommendations are highlighted in this section of the report.

### **Program Specific Suggestions**

The GreenCOM team invited the TAG members to offer their insights and suggestions, based on the information they had gathered through the GreenCOM presentations augmented by the research summaries provided in their briefing books, regarding three on-going projects in El Salvador, Nicaragua, and the Philippines. Coordinators of the activities in each one these countries made substantive descriptions of their programs and research related issues. Program profiles and specific recommendations for each project site are summarized below.

#### **1. El Salvador**

GreenCOM has been working with the USAID mission in El Salvador to support their strategic objectives for the environment for the past 3 years. GreenCOM's main goal is to improve the environment through legislation, technology and education, primarily by working to improve existing delivery systems. GreenCOM's work in El Salvador is related to raising environmental awareness; increasing knowledge of the problems and potential solutions/behaviors; and building institutional capacity. GreenCOM EE&C activities provide information and increases awareness to help support new environmental legislation. Other activities focus on increasing awareness of new technology and assisting in its application.

Annex D contains a general description of the scope of GreenCOM's work in El Salvador. To date, GreenCOM has helped carried out a wide range of formal, non-formal and informal EE&C activities, including:

- ▶ the development and introduction of an environmental curriculum for elementary school students and training of teachers to implement it;
- ▶ training of park rangers and extension agents in interpretation and communication techniques respectively;
- ▶ training environmental agencies in social marketing;
- ▶ providing technical assistance to a newspaper supplement addressing children to include appropriate environmental education content;
- ▶ organization of an environmental contest for children; and
- ▶ setting up an environmental award for TV, radio and newspaper journalists for their coverage of environmental matters; and
- ▶ TV and radio campaign development.

Although many of GreenCOM's activities have been well received, little effort has been made to

evaluate the impact of these activities on teacher, student, or extension agent behavior, or other outcomes, linking interventions to specific measurable improvements or changes. Funding for evaluation is available, but no baseline measures were obtained. GreenCOM also needs to gather process documentation, but the mission does not want to fund this. TAG members were asked to offer their ideas regarding creative ways to assess the role of GreenCOM in the success and impact of the varied activities implemented in the country.

In the absence of baseline data, possible solutions include:

- ▶ Doing a retrospective study of several different delivery systems GreenCOM has targeted (schools, mass media, ad agencies). Determine if environment-related activities have increased or decreased since project inception.
- ▶ Using Gallup polls to obtain comparative data from El Salvador or from neighboring countries in the region where GreenCOM is not operating.
- ▶ Conducting a newspaper analysis overtime to understand the evolution of concerns about the environment.
- ▶ Describing GreenCOM's role, or input, in initiating an observable change process.
- ▶ Evaluating GreenCOM supported activities to be initiate in the remaining year of project operations in El Salvador. For example:
  - use a pre-post design to evaluate a campaign to be implemented in the near future;
  - compare student results using the national testing system;
  - use a pre-post design to evaluate children in certain grades who are educated using the newly available curriculum;
  - compare public vs private school children who would be respectively exposed and not exposed to the newly available curriculum;
  - compare students in El Salvador in grades where the curriculum will be implemented with equivalent grades in comparable countries in Central America.
  - Involve the media in the evaluation of school-based programs in order to encourage similar efforts in the future.
- ▶ Record how much GreenCOM did, or effort expended (e.g. x number to training workshops), versus how much was received (x number of people attended).

- ▶ Do a newspaper survey. Look at expenditures of partners and compare differences.
- ▶ Hold a competition in the supermarkets. Or conduct surveys with grocery store patrons on the number of newspaper supplements dealing with the environment that they have seen, and their knowledge and attitudes about the environmental topics covered.

## 2. Nicaragua

In Nicaragua, GreenCOM is conducting formative research with coastal community members to inform the design of a community-based intervention to help protect sea turtle eggs. The intervention will be designed within the confines of the existing government-sponsored egg distribution program. The government and military now patrol the beach, tag and mark turtles, and count turtles and eggs per nest. The community elects leaders to pick up the eggs and distribute them to community members. But it is difficult to know how much illegal collection, selling and buying is taking place. Over the next two years, GreenCOM's mandate is to work with the government of Nicaragua to implement the existing policy.

Several questions remain unanswered: Is trust a barrier? Should GreenCOM engage people in a discussion on how to modify the system? The doer/non-doer (observers of the law/illegal collectors) difference is not distinct. Currently, the behavioral outcome desired is reliance on the MARENA egg distribution program to give back 20% of the sea turtle eggs to the community. It is expected that success will be based on carrying out a participatory process -- a policy dialogue. The government is trying to introduce co-management of the system by the community.

TAG members were asked to make suggestions regarding project design, implementation and evaluation. See Annex D for more detailed information on the activity.

### *Looking for Alternative Livelihoods*

- ▶ GreenCOM may be taking a risk by supporting the government's 20% harvest rate. The international environmental community (biologists and environmentalists) will probably object to this.
- ▶ There is the need to create market incentives to protect/conservate the turtles --- ecotourism or an adopt-a-turtle program, or other projects to give each egg a higher value. It's easier to protect all the eggs than to retain a partial collection system.
- ▶ The project should look beyond just the sea turtle eggs and focus on tourism. Have a monthly turtle festival and publicize eco-tourism. But the policy needs to be changed so that the community can benefit from tourism. The long-term goal is better management, better policy, and a better community. But this is only the first stage.

### ***Obtaining More Biological and Socio-Economic Information***

- ▶ The Government of Nicaragua and GreenCOM need to know the current hatch rates (they are estimated at 50%) before making further decisions about where to go with the program.
- ▶ The legal framework is unclear. If the issue is to protect the species, then harvesting of eggs should either be allowed or banned. What is the goal? What does the 50% hatching rate and 20% distribution rate mean? How many turtles survive?
- ▶ GreenCOM must understand the community's needs for the turtle eggs -- is it to supplement their diet or their income?

### ***Developing a Focused Intervention and Appropriate Indicators to Measure Success***

- ▶ Does GreenCOM want to support an egg collection policy? Does GreenCOM want to define success by eggs hatched? People changed? Policy upheld? Meeting community needs? GreenCOM needs to carefully design the goal so it can see success of which it can be proud. Do not expect to achieve a long-term goal in a short-term project like this. Set appropriate indicators of success.
- ▶ If the goal of the intervention is to show citizens the value of the turtles, then the country could remain happy with the 20% harvest rate or choose to reduce it to 0, with the citizens as the motivating force to change the existing policy.
- ▶ Since the country is very concerned about corruption within the egg distribution system, focus on the access issue and make the system more transparent.
- ▶ Alternative behavioral outcomes could be to get people not to buy the eggs or get them to sit down and discuss the issue. Clarify the goal of the intervention -- is it for people to reconsider the problem or to get people to stop buying poached eggs?
- ▶ Design the intervention so that success is not dependent upon relying on egg counts. Conduct a policy dialogue and do not expect to achieve an economic plan yet.
- ▶ Rally the community behind the current system and teach them turtle biology. Then move them towards protecting the turtle.
- ▶ It is unlikely that egg hunters will be able to implement co-management.
- ▶ There is a need to evaluate the larger issues: what values are important? Wealth; respect; affection; power; well-being; rectitude?

- ▶ GreenCOM needs to help people understand that loss of eggs to nature is inevitable. People need to believe there is an acceptable loss and understand the components of it.
- ▶ The eggs could be marked, as in Costa Rica, and only marked eggs allowed to be sold.

### **3. The Philippines**

GreenCOM has been charged with developing a national environmental communication strategy and using to the extent possible the findings from three formative research studies conducted in three different provinces with both upland and coastal communities.

A recurring theme from the research is that people need alternative livelihoods available to them in order to reduce reliance on the resource (whether fish or forests) and conduct themselves in an environmentally friendly way. In some cases, environmentally friendly interventions such as wildlife sanctuaries have been perceived by communities as a threat to their livelihood. Yet, social norms need to be operative in order for people to know certain behaviors are wrong.

The Prochaska-DiClemente behavior change model has been used as an analytical tool to help understand where individuals may be in a behavioral continuum that includes: pre-contemplation, contemplation, action, maintenance, and advocacy. Communities or individual stakeholders may not be at the same stage even when the analysis is used to focus on one specific environmental problem. The results of the analysis are more complex when the model is used to understand several environmental issues. The application of this model in the Filipino context has suggested that it may not be as applicable to communities as it is to individuals: the perception of the GreenCOM staff in The Philippines is that the strategy must target not individuals, but communities as a whole. This is true even though local initiatives that address environmental issues which involve larger segments of communities have confronted problems in the past for legal reasons. For example, the Protected Area Management Board (PAMBI) must approve local eco-tourism initiatives but often does not favor local resident involvement in certain environmental actions.

In light of the research findings, themes identified for the national strategy are:

- ◆ personal responsibility
- ◆ collective action
- ◆ stewardship
- ◆ leadership

TAG members were asked to provide advice on what should be included in the national strategy and how a social marketing approach can be designed to be sustainable. The following list summarizes the suggestions made by TAG members.

### ***Behaviors and Overall Strategy***

- ▶ Do not limit strategy to say “being environmentally friendly is good.” Promote specific behaviors. Tell stories and gather testimonials that include behaviors.
- ▶ Behaviors to be promoted do not have to be direct environmental behaviors but can be enabling institutional or contributing behaviors. If people do not engage in the practice that can have a direct environmental impact, make people engage in behaviors that may lead to that. In AIDS prevention, discussing sex was an important step in the right direction. Once people started talking about sex, they started talking about protective sex. This contributing behavior helped break down taboos and barriers. What taboos need to be addressed in the environment, if any?
- ▶ People may engage in behaviors that they see others doing or that they think others want them to adopt. Report polls about what others are doing and use models to suggest appropriate behaviors. Target both the younger and older generations.

### ***Advocacy: Private Sector, Media and Church Involvement***

- ▶ Partnerships with private organizations should help to market “environmentally friendly behaviors” (EFBs). Hold those who are doing the right things up as examples. Can use emblems that recognize companies based on strict criteria. Search for excellence, testimonials, and role models from the private sector.
- ▶ Look at multi-nationals, which are now using the same standard throughout the world. This should be the normative behavior. Recently, the World Business Council on Sustainable Development was held in Manila. Most companies have green teams and all companies are audited. The International Standards (150) for companies will be a good source of information. Look at suppliers of multi-nationals who will be receptive.
- ▶ Identify which companies will benefit from EFBs. Create a creed that reflects corporate responsibility. There is peer pressure among companies.
- ▶ In the U.S., industry awards associations helped motivate businesses to be environmentally conscious through local chambers of commerce.
- ▶ Get other advocates for the environment involved. The church should get involved in endorsing environmentally friendly actions as it is a credible source of information in the Filipino context. In fact, take advantage of the links that already exist between the archdioceses and the private sector.
- ▶ Do not think that social marketing is only “big media.” Social marketing can also be little media. Get the media involved at a lower cost. The environment could be part of the

news without specific environmental campaigns being implemented. Award schemes for environmental journalism have been effective in El Salvador in getting reporters interested in environmental topics.

- ▶ Other possible interventions and media include the following:
  - Design interventions that include the family as the primary target.
  - Start an “Underwater Restoration Project” to restore the coral reefs where tourists are invited to participate in the rehabilitation. Similar projects have been successfully implemented done in Mexico and the Caribbean.
  - Give schools a list of suggested environmental activities.
  - Put together a speakers bureau of people willing to talk to existing community groups.
  - Use cartoons.

#### ***Continuous Support for Environmental Communication***

- ▶ Keep the environment in the forefront the agenda by:
  - Involving politicians, particularly this year which is the international year of the reef.
  - Having environmental walkathons.
  - Organizing rock concerts: adolescents participate and they can get extensive media coverage. Successful experience with rock concerts from Mexico.

Throughout the course of the many discussions held during the TAG meeting, several major themes emerged across project activities:

- ▶ participation;
- ▶ project and campaign design;
- ▶ monitoring and evaluation; and
- ▶ outreach and dissemination.

Within each of these areas, the recommendations provided by TAG members are outlined below.

### **1. Participation**

GreenCOM may have achieved a breakthrough in terms of participatory stakeholder involvement and it is in a particular position to explore what it is and how it works. The challenge for GreenCOM is to help provide answers to the following questions.

- ▶ There are two kinds of participation: central level and grassroots. In either case, it can be stimulated from the outside. Stimulated participation may be different from the which occurs “naturally”. Can artificially stimulated participation last and/or be replicated?
- ▶ At the grassroots level, and when stimulated from the outside, do people want to engage in a participatory activity? Try to measure people’s interest in such an activity prior to initiating it.
- ▶ Does participation work any better than the alternative? If so, who are the key players needed to make it work and how are they identified?
- ▶ Bringing people to the table is not enough. How do you create rules so that everyone’s views can be heard? Even if this is achieved, how much participation is sufficient and what must occur during a participatory exercise to be successful? Particularly, what is the right balance between technical and process inputs?
- ▶ What is the broader context when local actions aren’t sufficient? There is a need for step-wise outcome indicators and a closer examination of what contextual pre and post conditions are necessary for success.
- ▶ There is no magical formula for participation, but you can draw on case studies. The process may involve a series of participatory steps.
- ▶ The Sustainable Development Tool Kit has information on consensual decision making and it may be useful for GreenCOM’s future participatory interventions.

## 2. Project and Campaign Design

- ▶ Telling people the environment is important is not enough. It is necessary to suggest specific behaviors that you want folks to do as a community or an individual. You need to give an action that can be evaluated.
- ▶ Create normative messages regarding the importance of the behavior. Environmental heroes and testimonials can be powerful tools. Communication campaigns that provide information that “others are doing it” can also be useful to communicate normative messages.
- ▶ Individual or community levels of change works with role model stories where specific actions are listed and described as “The Guy Next Door.” This is appropriate for small local campaigns.
- ▶ Environmental behavior change is largely collective, not individual, in nature. Look at systems theory, group theory, organization dynamics for understanding this approach and incorporating it into project design.
- ▶ Most projects must be relatively small in scale, due to financial constraints. However, small projects should be justifiable despite their size because either they are making a significant impact on an important problem or they are very replicable.
- ▶ GreenCOM must justify the resources spent on small activities such as Morocco and Nicaragua. These activities may provide models that can be transferred. Write a manual on how to diffuse it. Then you must evaluate the diffusion.
- ▶ Is long-term sustainability an issue? Should a program be designed for the least-cost alternative so it can be sustainable? But costs are not everything and may not represent what is really important. Consider making inter-ministerial communication a major goal and achievement in a project.
- ▶ Missions drive the cross-sectoral activity with GreenCOM. GreenCOM must communicate, during the design phase, that evaluation will support the mission.
- ▶ Distinguish the research goal and the strategy. Is the goal to increase participation or improve the environment with participation? What is the role of communication? There are only a few environmental problems that participation and communication alone can solve.

### 3. Monitoring and Evaluation

- ▶ Congress and USAID as well as other funders are looking for success stories. Yet, it may be unclear what impact behavior change will have on the environment. Models need to be developed to prove that behavior changes will lead to medium and long-term environmental change. EE&C interventions are often short-lived and should not be held accountable using long-term impact evaluation criteria. Instead, what is needed are short-term indicators that match the content and duration of the interventions being funded. Consequently, appropriate “outcome” indicators are needed. Focus on changes in attitudes, beliefs, or behaviors targeted by EE&C interventions.
- ▶ There are two types of evaluation: one asks whether the program works, and the other whether the program is transferable and sustainable. Whether the program is working can be answered through “bean counting.” This information can be used by an “unsophisticated” audience. For example in the Philippines, one may conduct a survey using a pre-post design two years apart to measure the number of people who understand the value of the fish sanctuary. Sophisticated audiences will be interested in the sustainability of the activity. GreenCOM needs to decide which type of evaluation it should conduct and which audiences to target with the information gathered.
- ▶ The cost-effectiveness of EE&C interventions is hard to assess since it is difficult to assign a dollar value on environmental “commodities.” It is hard, if not impossible, to put a price on a gallon of water or a sea turtle egg (saved). However, one may talk about vectors and ask whether the program is helping to move in the right direction.
- ▶ If we can’t establish the ultimate target environmental impact, then we should look for intermediate results. Identify several “pressure points” -- key areas of importance because they are a barrier or a solution --- and try to affect those in a measurable way.
- ▶ One of the major constraints GreenCOM faces is the lack of funding to conduct evaluations. Often funding has not been made available to conduct a baseline study to have comparison points to measure impact. When a baseline study is not possible, the only option may be process evaluations and monitoring systems which allow GreenCOM to determine if target audiences are being reached, if interventions are being implemented, etc. However, future funding for EE&C interventions may be jeopardized if appropriate evaluations are not conducted. Hopefully, the re-engineering of USAID will create an environment that is more favorable towards evaluations, particularly since everything will have to be geared towards indicators/results. GreenCOM needs to measure results, otherwise it will not know if the R4s are being met.
- ▶ GreenCOM needs to assess the commonality of projects and make sense of how people understand environmental problems and move towards change. This is a slow, thoughtful and methodological process. There is a need for a meta-analytic framework across

several projects. This would represent a breakthrough for the field.

#### **4. Outreach and Dissemination**

- ▶ The field is hungry for case studies about the social side of environmental issues, and GreenCOM is in the process of creating a series of these. Each study has its own model and important results, and these findings should be shared with the international development and academic communities. It is important to focus on commonalities across projects and identify a model that is replicable, if possible. GreenCOM should consider the specific as well as general applicability of these cases, and should aggressively disseminate them in both social science and environment circles.
- ▶ Results should be written as success stories to help AID politically.
- ▶ Develop synergy with LearnLink.
- ▶ GreenCOM needs to search the literature from other projects where they have created case studies similar to GreenCOM's work - analyze them across similar lines and learn across the AID portfolio.
- ▶ GreenCOM could build on public/private partnerships to disseminate lessons learned. Much research is "dying on the wall" because researchers do not get findings into the hands of users. GreenCOM needs to help create a dialogue between the two.

**Environmental Education and Communication (GreenCOM) Project  
Technical Advisory Group (TAG) Meeting Agenda  
February 6 & 7, 1997**

**Day One Morning Session :**  
**Sharing our Experience to Date**  
**GreenCOM's Contributions to USAID's Strategic Objectives**  
**Chair: Brian Day, GreenCOM Project Director**

**Thursday, February 6, 1997**

**8:30 Registration and Coffee Service**

**Welcome**

Stephen Moseley, AED President

**Introduction of TAG Members**

**Opening Remarks**

David F. Hales, Deputy Assistant Administrator  
Center for the Environment, USAID/Washington, D.C.

Emily Vargas-Baron, Deputy Assistant Administrator  
Center for Human Capacity Development, USAID/Washington, D.C.

**Purpose of the 1997 TAG Meeting**

Kate Barba, EE & C Advisor  
G/HCD/FSTA, USAID/Washington, D.C.

***Beyond Just Listening To People: Lessons Learned and New Directions***

**GreenCOM's Unique Contribution to USAID's Strategic Objectives: Lessons Learned**

Brian Day, GreenCOM Project Director

A1

**Issues for GreenCOM Research: An Overview**  
Susan E. Middlestadt, Senior Applied Research Advisor

**Participatory Programming**

**Biodiversity**    **Dynamite and Deforestation: Participatory Program Development (The Philippines)**  
Will Shaw, GreenCOM/Philippines Project Coordinator  
Orlando Hernández, GreenCOM Research Director

**Water**            **Peaceful Waters: Sharing Best Practices in Water Conservation (Middle East)**  
Kate Barba, EE & C Advisor, G/HCD/FSTA, USAID/Washington  
Mona Grieser, GreenCOM Senior EE & C Specialist

**Biodiversity**    **Encounter of Stakeholders: A Different Kind of Research? (El Salvador)**  
José Ignacio Mata, GreenCOM/El Salvador Resident Advisor

**Biodiversity**    **Linking Community Forest User Groups to Policy Makers Through Different Media (Nepal)**  
James French, GreenCOM Deputy Director

**BREAK**

**Levels of Involvement in Research**

**Biodiversity**    **Laying the Golden Egg: Community Involvement in a Sea Turtle Egg Distribution Program (Nicaragua)**  
Nina Chambers, GreenCOM/Nicaragua Project Manager

**Water**            **When Ministry Staff Become Researchers (Egypt)**  
Laurie Krieger, Research Consultant  
Brian Day, GreenCOM Project Director

**Urban**            **Degrees of Separation: Discussing & Researching New Solutions to Garbage Problems in Fez (Morocco)**  
Orlando Hernández, GreenCOM Research Director

**Discussion**

**12:30**

**LUNCH**

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**Day One Afternoon Session:  
Innovations in Participatory Research for USAID's EE & C  
Chair: Susan E. Middlestadt**

**1:45**

**Consult the Oracle Session (TAG Brainstorming):  
Nicaragua Research Strategy**

Facilitators: Orlando Hernández, GreenCOM Research Director  
Nina Chambers, GreenCOM/Nicaragua Project Manager

**Break**

**Consult the Oracle Session (TAG Brainstorming):**

**Research in El Salvador in Support of National Environmental Education Strategy**

Facilitator: José Ignacio Mata, GreenCOM/El Salvador Resident Advisor

**Summary of Today & Logistics for tomorrow**

**5:00-7:00**

**Reception**

**Day Two Morning Session:  
Future Directions for GreenCOM**

**Chair: Jim French, GreenCOM Deputy Director**

**Friday, February 7, 1997**

**9:00**

**Consult the Oracle Session (TAG Brainstorming):**

**Philippines National Environmental Communication Strategy**

Facilitators: Becky Pestaño Smith, Development Communications/Research Specialist  
Ed Douglass, GreenCOM/Philippines Resident Advisor

**Break**

**Consult the Oracle Session (TAG Brainstorming):**

**Reflections on GreenCOM's Future Research Agenda**

Facilitators: Susan E. Middlestadt, AED Research Director  
Orlando Hernández, GreenCOM Research Director  
Martha Monroe, GreenCOM Resource Center Director

**Closing Remarks**

Brian Day, GreenCOM Project Director

**12:00**

**TAG 1997 Adjourns**

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### WALTER ARENSBERG

For the past six years, Mr. Arensberg has served as the deputy director of the World Resources Institute's (WRI) Center for International Development and Environment. In this role, he oversees the USAID-funded Environmental Planning and Management Project, which provides technical support services in strategic planning for resources management, environmental monitoring, and information systems, and training for community organizations throughout Africa, Asia, Central and South America, and the Caribbean. Prior to joining WRI, Mr. Arensberg was a consultant to the International Institute for Environment and Development, where he evaluated various programs implemented by non-governmental organizations (NGOs). He also was a general partner in the urban planning firm of Skidmore, Owings, & Merrill for 14 years, where he managed domestic and international land use, transportation and urban redevelopment projects, as well as conducted environmental impact assessments and policy analysis. From 1966 to 1968, Mr. Arensberg served as evaluation officer for the U.S. Peace Corps. Mr. Arensberg has a M.A. in city planning from Harvard University.

### JOHN BALDWIN

Dr. Baldwin is an accomplished environmental scientist and educator. Currently, he is head of the Institute for a Sustainable Environment, at the University of Oregon. In 1993, he served as president of the North American Association for Environmental Education (NAAEE), the largest professional organization of its kind in the world. He has extensive domestic and international experience on a range of environmental issues, but is especially well recognized for his work on the effects of pollution on humans. For NAAEE, he is working with colleagues in Kiev, Ukraine to establish an environmental education center in that city. Dr. Baldwin was also the principal investigator of a project entitled "Chernobyl: Applied Information for Education and Decision-Making" and continues to serve as a visiting associate professor of the environmental science program at the International University in Moscow. He has a Ph.D. in Zoology and Wildlife Ecology from the University of Wisconsin.

### JUDY BRAUS

A leading environmental educator in the U.S. and internationally, Ms. Braus is currently the director of environmental education for the World Wildlife Fund (WWF). Supported by a \$2.5 million grant from Eastman Kodak, she is developing and implementing a national biodiversity environmental education program for the U.S. Prior to joining WWF, she spent two years as Program Manager for Environmental Education with the U.S. Peace Corps where she: helped develop long-term objectives and plans for new environmental initiatives in several countries; developed model workshops to link environmental education with English and science teaching; and designed an agency-wide strategy for incorporating environmental content into pre-service training for all Peace Corps volunteers. From 1987 to 1991, she served as the National Wildlife

Federation's director of environmental education, and also was senior editor of the children's magazine, *Ranger Rick*. Ms. Braus is co-author of *Environmental Education: Creating a Program That Works!*, a 200-page book for national and international audiences. She has a B.S. in environmental science from the University of Maryland.

### **MARTIN FISHBEIN**

Dr. Fishbein is a preeminent behavioral scientist and creator of the *Theory of Reasoned Action*. At present, he is professor of psychology and research professor at the Institute of Communications Research, University of Illinois. He is also a consultant to the National Institute of Mental Health's AIDS Research Program and serves on several NIMH advisory committees. Dr. Fishbein has been honored by the American Marketing Association for his contributions to marketing research. He holds a B.A. degree in psychology and economics from Reed College and a Ph.D. degree in psychology from the University of California, Los Angeles.

### **JOANNE FOX-PRZEWORSKI**

Dr. Fox-Przeworski is the Director of the Regional Office for North America of the United Nations Environment Programme (UNEP). Prior to assuming this position in spring 1995, she worked with the Organisation for Economic Cooperation and Development (OECD). There, she served as Coordinator for Sustainable Development and Advisor to the Deputy Secretary-General on the agreements reached at the UN Conference on Environment and Development and on liaison with the UN. Previously, she was Head of the Development Assistance and Environment Section in the Development Co-operation Directorate. From 1991-92, she also served as special assistant to the Deputy Secretary-General on the first OECD joint meeting of Ministers of Environment and of Development Co-operation and on preparations for the United Nations Conference on Environment and Development. She has also been principal consultant to the Urban Affairs Division, Environment Directorate, OECD, for projects on urban impacts of technological and socio-demographic change and on urban economic development. Before joining the OECD staff, she conducted policy research and fora on the role of community-based organizations, corporations, and foundations in urban development as project director at TRUST, Inc. in Chicago. Dr. Fox-Przeworski received a doctorate in economic history from Washington University and her M.A. from Harvard University.

## **LYNNE HALE**

Ms. Hale is associate director of the Coastal Resources Center (CRC) at the University of Rhode Island (URI), an organization dedicated to developing strategies for the effective management of coastal environments in the U.S. and worldwide. She is a specialist in the design and management of coastal ecosystem management programs with more than 20 years of domestic and international experience in public education, participation, training, and outreach activities. Concurrently, she is assistant director of the USAID-funded Coastal Resource Management Project, a ten year cooperative program with major pilot programs in Ecuador, Sri Lanka and Thailand. Since 1977, she has worked intermittently on coastal and marine resource issues that impact native Alaskan communities. In addition to her position with CRC, she is an adjunct assistant professor in URI's Department of Marine Affairs. Ms. Hale has a M.S. in biological oceanography from the University of Rhode Island.

## **ROBERT HORNİK**

Dr. Hornik is an expert in development communications, evaluation design and analysis. He is professor of communications at the Annenberg School of Communications and director of the Center for International Health and Development Communication. His research has been instrumental in helping program and field practitioners develop a better understanding about the factors that influence people to change their health and nutrition behaviors. Dr. Hornik has served as principal investigator or co-principal investigator on five A.I.D.-funded research projects including HEALTHCOM and AIDSCOM evaluation subcontracts, and has participated in several prestigious committees, including the National Academy of Sciences' Committee on International Nutrition Programs, and the WHO/Global Program on AIDS' Steering Committees on Behavioral Research and Evaluation. Among his numerous publications on development communication is *Development Communication: Information, Agriculture, and Nutrition in the Third World*. He has a Ph.D. in communication research from Stanford University.

## **PAUL NOWAK**

Paul Nowak has been associated with the School of Natural Resources and the Environment at the University of Michigan for more than two decades. Among his responsibilities, he has been director of the National Consortium for Environmental Education and Training; director of Professional Education; and Director of the Wildland Management Center. He serves as a member of the Education Committee of the President's Council for Sustainable Development and on the Global Rivers Environmental Education Advisory Committee. Dr. Nowak also spent five years teaching in the College of Education at Southern Illinois University from 1969 through 1974, and was a science teacher in two Detroit public elementary schools. He has written books, articles, and training materials on solid and hazardous waste, watershed management, and environmental journalism. Dr. Nowak has his B.S. and M.S. degrees from Wayne State University and his Ph.D. in Natural Resources from the University of Michigan.

## **TIAHOGA RUGE**

Ms. Ruge has extensive international experience in promoting the environment through television, films, and other communication vehicles. She is currently director of the North American Center for Environmental Information and Communication, headquartered in Mexico. She has produced and directed films and documentaries on social and environmental issues, including a five-part series on the Biosphere 2 project. She was Science and Culture Counselor for the Embassy in Mexico in India from 1984 through 1988. From 1988 through 1991, back in Mexico, she designed and directed the "Mass Media and Environment: A National Call for Environmental Awareness" project. In 1991, Ms. Ruge received the UNEP Global 500 Roll of Honor award. Ms. Ruge has an M.S. degree in biology from the University of Houston and an M.A. in film direction from Cinecitta in Rome, Italy, where she also worked as an assistant to the film director Federico Fellini.

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An environmental engineer and pollution prevention specialist with 25 years of professional experience, Mr. Zosel is one of the nation's foremost experts and promoters of industrial waste reduction. Currently, he is manager and one of three initiators of 3M's renowned pollution reduction program, "Pollution Prevention Pays" -3P. Mr. Zosel has been at the forefront of developing corporate and industry strategies for promoting and adopting waste reduction technologies in advance of new, more stringent environmental regulations. A nationally recognized authority on the Clean Air Act, regulatory reform, emission trading, and implementation pollution prevention technology, he is a member of EPA's Clean Air Act Advisory Committee and co-chair of the Subcommittee on Pollution Prevention and Early Reduction, and chair of the American Institute of Chemical Engineers Center for Waste Reduction Technologies. Mr. Zosel has a B.S. in Chemical Engineering from the University of Wisconsin.

GREENCOM

APPLIED RESEARCH SUMMARY

QUITO, ECUADOR  
GENDER AND RECYCLING,  
QUANTITATIVE FORMATIVE STUDY

February 1997

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PURPOSE

In support of USAID's strategic objective of sustainable urbanization:

- ▶ To identify determinants of garbage separation practices and to understand garbage disposal practices in inner city neighborhoods participating in pilot recycling program, at the household level overall and by gender.
- ▶ To contribute to the development of a gender-sensitive educational intervention in support of garbage separation and recycling practices.

BACKGROUND

The pilot program was initiated by the Municipality of Quito in 11 inner city neighborhoods in 1993. The program required participants to separate garbage into: organic (fruit skins, vegetable peels, leftovers), recyclable (paper, plastic, glass and metal) and sanitary (used toilet paper, sanitary napkins, tissue paper, pampers, etc). Different types of garbage are collected on specific days. Neighborhood micro-enterprises are responsible for collecting and disposing of the garbage collected. Organic garbage may be used by micro-enterprises to produce compost. Recyclable waste is sold to nearby intermediaries. This reduces the cost of transporting the waste to a landfill outside of Quito. Originally, the program distributed plastic bags to promote garbage separation. Garbage recycling rates have dropped over time in the neighborhoods that have participated the longest in the program. The Municipality wishes recycling rates to increase.

This study was preceded by a qualitative phase. During the qualitative phase, focus groups and in-depth discussions were held with service providers and neighborhood residents to identify perceived benefits and drawbacks of garbage separation at the

household level. The uses and destination of different types of garbage were also explored. This information was used to refine the research methodology for the quantitative study here described.

#### **RESEARCH METHOD**

- ▶ Random selection of blocks and households in four inner city neighborhoods was used to identify a total sample of 400 male and female heads of households.
- ▶ The sample was surveyed using pre-tested questionnaire based on qualitative study that investigates knowledge of pilot programs characteristics; attitudes, beliefs and behavior about garbage separation and garbage disposal; roles of men and women in household; media preferences; community organization involvement; and socio-demographics.

#### **VALUE**

- ▶ Contributes to the expansion and improvement of basic services in urban settings, helps to reduce urban pollution, and helps to make inner city neighborhoods more livable by reducing the threat of disease.
- ▶ Permits the application of social marketing and behavior change principles to the development of educational intervention to support garbage separation and recycling.
- ▶ Introduces behavior change theory to leading NGO that specializes in environmental education and communication.
- ▶ Helps collaborating NGO, municipality, and local governmental organizations develop educational programs for areas where recycling programs may be expanded or initiated.

#### **STATUS**

- ▶ Research and analysis completed.

#### **KEY FINDINGS**

- ▶ The municipal government's perception of solid waste differed greatly from the households' perceptions.
- ▶ According to neighborhood residents, the only real "waste" was sanitary waste. All other types of waste were viewed as valuable commodities that could either be reused by household members, given to others to reuse, or sold to scavengers. Neighborhood residents often mix bathroom waste with other types of waste given to waste collectors, mainly organic waste, because they believe it is unhealthy to keep it for too many days in

the household. The current collection system collects sanitary waste only once a week. Residents believe that it should be collected more frequently.

- ▶ Although the municipality recognized the usefulness of the role that scavengers play as an informal part of the waste collection system, it was concerned about reducing the number of scavengers who comb the landfill and decreasing the adverse health effects this practice can cause. The municipality tried to create incentives for scavengers to operate from collection points inside the city, rather than the site of the landfill, and provided protective equipment (e.g., gloves) to scavengers for handling waste.
- ▶ Results of the study also revealed that whether or not neighborhood residents practice waste separation can be predicted by several factors, including:
  - 1) knowledge of the pilot program guidelines and the kinds of waste products that make up organic, recyclable, and sanitary waste;
  - 2) satisfaction with the waste collection service, particularly its reliability;
  - 3) agreement with giving waste which has commercial value to collectors; and
  - 4) perceptions of social pressure about separating waste.
- ▶ Men and women respond differently to some of the variables cited above:
  - Agreement with giving waste which has commercial value to collectors was a predictor of waste separation for women but not for men.
  - The sources of social pressure to which men and women respond when they separate their waste are also different. Whereas social pressure from neighbors is a predictor of waste separation for men, social pressure from neighbors and family members is a predictor of that same behavior for women.
- ▶ Both male and female respondents considered insects and unhygienic conditions to be the major adverse outcome when waste was not given to recyclers. Pollution and environmental destruction were reported to be the primary environmental effects. The poor appearance of the neighborhood was the most commonly voiced social concern.
- ▶ When asked how waste should be handled to prevent destruction of the environment, statistically significant differences between separators and non-separators were found. The former more often suggested "recycle" than the latter. No gender differences were noted.
- ▶ For both men and women, separation practices were clearly linked to their perception of

what happens with the funds generated by the sale of the recyclable waste. One of the major obstacles to participate in the recycling program is that residents believe that by giving waste with commercial value to waste collectors they are foregoing income that they normally get by selling some recyclable products to scavengers who go house to house looking for products to buy (mainly clear glass bottles, plastic oil containers, and cardboard). In order for residents to give up the profits that the sale of recyclables to scavengers and middle men produces, they wanted to be certain that the funds will be channeled into a worthwhile project to benefit their neighborhood.

- ▶ The mass media channels most commonly used by males and females (in decreasing order of popularity), include: television, radio, newspapers, and magazines. However, males more often read newspapers than females.
- ▶ Neighborhood news is generally obtained through more informal networks. In general, relatives and friends serve as the most common source of information about neighborhood events. Churches and neighborhood assemblies also serve this function.
- ▶ Only a small portion of the sample reported belonging to any type of local organization. For-profit neighborhood committees and housing cooperatives were the most commonly mentioned local membership organizations. While men more often reported belonging to sports clubs, women more often belonged to housing cooperatives.

#### **PROGRAM IMPLICATIONS**

- ▶ Results of the analyses led to the formulation of several recommendations that can be classified into three categories: those pertaining to programmatic issues, those pertaining to educational issues, and those pertaining to methodological issues.
- ▶ The Programmatic Recommendations include:
  - Organize a meeting of male and female stakeholders, including neighborhood representatives, to decide the future direction of the program.
  - Evaluate alternative ways of handling organic waste, including the feasibility of composting.
- ▶ Several Educational/Promotional Recommendations were suggested if the pilot program continues to be implemented in its current form.
- ▶ Topics for a Promotional/Educational Strategy were suggested for use if the stakeholders determine that the goal of the municipality is to reduce the amount of waste destined for the landfill.

**APPLIED RESEARCH SUMMARY**

**EGYPT**

**FARMER AWARENESS AND BEHAVIOR RELATED TO LIMITED WATER**

FEBRUARY 1997

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**PURPOSE**

In support of USAID/Cairo's Strategic Objective to increase private sector led, export-oriented economic growth. Within that objective, the activity relates to improved water resources allocation and communication interventions to link water users and policy makers.

More specifically, to:

- identify familiar images associated with water;
- identify farmers' beliefs about current and future water scarcity;
- identify current water conservation practices and farmers' motivations for their adoption;
- identify the roles farmers believe they should have in an irrigation system; and
- train WCU's staff in the use of qualitative research methods and the use of formative research to develop campaign messages.

**BACKGROUND**

Thanks to the Nile River, Egypt had an abundance of water for centuries. With the construction of the Aswan High Dam, however, Egypt agreed to share the Nile River. Through an established agreement with neighboring countries, the amount of water Egypt can release from the High Dam is 55.5 BCM (billion cubic meters) per year. Within the past 10 years, Egypt has moved from having a water surplus to a water deficit. In 1996, for example, Egypt will use more than 63 BCM of water. The difference between what is made available through the High Dam and estimated national consumption is made up by reusing water, which depends on the pollution levels of water. The Ministry of Public Works and Water Resources (MPWWR) in Egypt is interested in making the farmers aware of the water scarcity problems the country faces.

MPWWR requested assistance from the GreenCOM Project to develop a communication intervention based on the concept that Egypt has a fixed amount of water available and in the

future, as population increases, each individual's share will be more limited. This strategy is to serve as a base for future interventions directed at helping water users conserve water. The basic assumption of the first campaign is that increased awareness about water scarcity will lead to the adoption of water use efficiency practices or at best, water conservation behaviors by farmers.

The research discussed in this summary is formative research used to guide some of the decisions made for the first campaign. Contributors to this work include staff of the Water Communication Unit (WCU) of MPWWR and from the Ministry of Agriculture (MOA). GreenCOM trained WCU staff in qualitative research methods, data analysis, and interpretation. Data reported here were collected, analyzed, and interpreted by that staff with inputs and guidance from a GreenCOM staff member and a GreenCOM consultant.

## **RESEARCH METHOD**

The research was conducted in Damietta, Al Fayyum, and Aswan respectively located in Northern, Central, and Southern Egypt. Each one of those regions have different levels of access to irrigation water. It is less abundant in Damietta, average for Egyptian standards in Al Fayyum, and more abundant in Aswan. Data were obtained through 9 male and 8 female focus groups, and 19 in-depth interviews with engineers, teachers, and officials. Focus groups were constructed using a 2x3 design of gender and farm location respectively. The three type of farm location were: farms near the beginning of the irrigation system, those near the beginning of the system but on a higher elevation, and those at the end of the irrigation system. In-depth interviews were used in part to cross-check farmers' perceptions. Data were analyzed and synthesized daily.

The WCU staff received two days of training on qualitative research methods, specifically utilizing interviewing techniques. After the training, practice focus groups for each sex and several individual interviews were held to field test the WCU staff's new skills and the focus group and interview guide materials. Daily review of results reinforced the training.

## **STATUS**

Completed in September 1996.

## **KEY FINDINGS**

Water is believed to bring life to plants, animals, and humans and is a gift from God to the world.

Farmers understood and were very concerned about water shortage at the local level.

“The land is more now, so the water isn't enough.”

“In the summer, water is supposed to be scheduled for five days, but the water only

comes for one or one and one-half days.”

“Water is important and it only comes every 22 days. What can we do?”

Some farmers, mostly women, however, believed there was no national water shortage, and several cited news reports as proof.

“We listen to the news and we hear that the Nile has increased from Lake Nasser and the dam is 10 cms higher than last year.”

Most respondents did not know that Egypt signed a treaty which would limit water availability. Furthermore, almost all people in all three governorates divided time with respect to water into two periods: before and after the High Dam. Except for Dumiat, most respondents said that there is more water now than before.

“Now I grow rice. I couldn’t before, there was not enough water.”

Respondents longed for the water quality of the past. Water pollution was a big concern to most study participants.

“In the past, water brought health not only to people, but to the land. Now the earth is sick from the water.”

Dumiat farmers expressed feelings of desperation related to the decline of their health and those of their families.

“We want the water cleaned because our husbands are dying;” “Our children are falling ill and being born sick because of the polluted water.”

Dumatis blamed the rest of Egypt as well as themselves for the pollution problems.

“Before whoever wanted to get rid of their sewage dug a hole in the ground. Now they dump it in the canal.”

Generally farmers engaged in a variety of practices that result in efficient water use, although saving water was not always the explanation given by farmers for why these practices were adopted and maintained. These practices include:

- Night irrigation (“Watering at night is better because the ground is cooled and it takes water right away”);
- Leveling land the land (“Crops have to receive water equally. You have to level the land, it’s the way in farming”);
- Selection of crops partially based on the crops’ water requirements (“I grow sweet

- potatoes because I do not have much water” or “Women like to grow peppers, local greens, okra, tomatoes-- they don’t take much water);
- Selection of crops based on water requirements of both farmers themselves as well as their neighbors (“We try to group together to grow the same things . . . so my children don’t take (water) from my neighbor’s field”);
  - Cutting grass in canals to facilitate water flow.

Farmers didn’t understand the reasons behind irrigation laws and objected to some of them. They were usually not acquainted with the District Irrigation Engineer. Farmers tried to influence decisions about irrigation by complaining to the local council who raised the issue at the district and governorate level or by writing letters or telegrams to policy makers or policy implementers. Farmers both fight and cooperate around water. They fight when they believe others are taking advantage of the water supply for themselves to the detriment of others. They cooperate to clean water canals and to ensure that there is equality in water distribution and use.

National television stations were by far the most important communication channels, with both sexes watching mostly in the evening. Other sources of information included the radio, a newspaper, or what their children learn from school.

#### **PROGRAM IMPLICATIONS**

Although the research helped solidify some aspects of the mass-media communication campaign and differences that exist among groups, several results were used to modify the original campaign plan:

- Education needs to include exposure of the MPWWR and explanation of policies.
- Since water is a symbol for and source of life, farmers can be encouraged to protect that life.
- Water scarcity should be linked to population growth.
- Since the High Dam is the way farmers divide the past and present, use that benchmark to deal with water scarcity issues.
- Local water issues need to be linked to the overall picture in the campaign.
- Messages need to identify conservation behaviors already used and farmers should be praised for these efforts.
- Farmers’ role in water conservation should be explained, as should the advantages to them, such as self-sufficiency and being able to take care of their family.

- Communication should focus on evening television viewing and through personal communication with adults and their children.
- Messages should be developed using local language (i.e. most farmers refer to mesqas as bahrs) and more research needs to be done to understand and use the technical aspect of interpersonal relationships in the villages.
- WCU has learned a lot about qualitative research methodology and the implementation of these findings; however, they will need further training and supervision before they will be able to do these activities independently.

**APPLIED RESEARCH SUMMARY**

**EL SALVADOR  
CONSULTING FARMERS TO DEVELOP INCENTIVES FOR  
MAKING PERMANENT LAND COVER INVESTMENTS**

February 1997

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**PURPOSE**

In support of USAID's strategic objective of increased use of environmentally sound practices in selected fragile areas, this research activity was designed to:

- ▶ identify socio-economic groups which may be affected by a policy supporting permanent land cover investments and determine their geographic location;
- ▶ describe their land tenure situation, size of holding, type of crops and investments made in forests;
- ▶ describe their economic livelihood and current economic situation;
- ▶ identify the motivations these groups have to make investments in permanent land cover;
- ▶ explore the relationships between investments in permanent land cover and level of education, level of family integration, and gender; and
- ▶ determine their involvement with the forest policy formulation process.

**BACKGROUND**

Up to 12/96, GreenCOM was the educational component of a larger environmental project in El Salvador: the Green Project. That project has a policy component. The research described here was GreenCOM collaboration with the development of a new forest policy by the Green Project. It was a first attempt to consult the potential beneficiaries of the forest policy. Other studies are planned as part of the effort to understand these beneficiaries.

**RESEARCH METHOD**

Secondary analysis of existing data sets and documents were conducted prior to field visits. In-depth interviews with key informants and focus group discussions were used to collect the data in the field. A total of 98 persons were interviewed, 69 were men and 29 were women. Respondents came from either the watersheds of critical water systems in the country and or were farmers cultivating permanent crops of highest commercial value. Loggers and lumber dealers were also interviewed.

## VALUE

Provide input to policy formulators about types of socio-economic groups for which incentives must be included in future laws and the type of response to those incentives that may be anticipated.

## STATUS

- ▶ Research completed.

## KEY FINDINGS

- ▶ Target groups for a policy on permanent forest cover include: farmers in critical watersheds in the country plus residents in mangrove areas and producers of coffee, balsam resin, and sisal.
- ▶ In the watersheds visited, there is a high proportion of land being used by tenants. Tenants use the plots only for one cropping season. Landowners are fearful of allowing the same tenant to use the land for two cropping seasons in a row due to fear of expropriation. Tenants are unlikely to make permanent land cover investments, and even less so if the periods during which they use the land are short.
- ▶ Farmers in the watersheds have unusually high demand for firewood which needs to be reduced.
- ▶ There has been a 7% reduction in land planted with coffee in the past years. Several factors explain the reduction: coffee world prices, urbanization, labor shortages, high coffee processing costs, limited processing facilities for small producers, and crime. World coffee prices have pushed some farmers out of production. In addition, some coffee plantations near cities have been converted into housing developments. Due to remittances from relatives living in the United States, labor for picking coffee has become scarce. Too few facilities process coffee in the countryside and profits are made mainly by processors thus forcing producers out of the business. Some coffee producers have been kidnapped in return of a ransom. Finally, some coffee producers have opted for other economic activities.
- ▶ Balsam resin production has been reduced by half over the last ten years. Several reasons explain the drop.
  - a) Beneficiaries of land distribution programs with balsam producing trees have preferred to sell the trees for firewood rather than keep them to produce resin.
  - b) Other species are preferred to provide shade to crops cultivated under a canopy.
  - c) Traditional balsam extraction techniques are dangerous and have discouraged new

rural residents from learning the trade. Consequently, there is shortage of labor to harvest the trees.

Although reforestation efforts are increasing, they often fail because there are no provisions for the maintenance and care of saplings. Timber from Honduras fetches a better price on the market, discouraging increased investment in Salvadoran timber.

#### **POLICY IMPLICATIONS AND RECOMMENDATIONS**

Extend the period during which tenants can rent land to several years, making the extension contingent upon the planting of permanent land cover on the rented plots or the adoption of soil conservation measures appropriate to the land.

Reduce demand for firewood in the critical watersheds. In the immediate term, reduce demand by promoting firewood-saving stoves. In the medium and long term, provide women with alternative livelihoods and more educational opportunities in order to reduce population growth.

In the case of coffee growers:

- ▶ transfer the function of coffee market development from the Consejo Superior de Cafe to the more efficient PROCAFE;
- ▶ offer arbitration to readjust the most egregious disadvantages producers face from coffee processing facilities;
- ▶ offer tax breaks to offset the levies that currently cut into the income of producers;
- ▶ facilitate the purchase of needed machinery at preferential rates in exchange for planting and maintaining the area covered with coffee trees or shade trees, thus offsetting the negative impact of labor shortages;
- ▶ increase security to deter future kidnappings.

Create incentives for the protection of reforested areas.

Conduct a more in-depth study of the lumber industry. Consider establishing a system of logging permits based the degree of scarcity and girth of trees.

**APPLIED RESEARCH SUMMARY**

**HAITI FORMATIVE RESEARCH FOR URBAN POLLUTION  
PREVENTION PROJECT  
CITE SOLEIL, PORT-AU-PRINCE**

February 1997

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**PURPOSE**

In support of USAID's strategic objective of sustainable urbanization,

- ▶ To identify water, human, and solid waste disposal practices among residents of Cité Soleil outside of Port-au-Prince, Haiti.
- ▶ To identify actions that can be undertaken by neighborhood residents to maintain and protect the new water system to be put in place in Cité Soleil.
- ▶ To identify residents' interest in using and paying for public laundry facilities, public toilets, and public showers as well as involvement in actions to prevent flooding in flood-risk areas of the slum.
- ▶ To determine which communication channels to use in the eventual promotional campaign.

**BACKGROUND**

The Centres pour le Développement et la Santé (CDS), a Haitian NGO, obtained UNDP funding for the installation of a water distribution system in Cité Soleil, a slum settlement in Port-au-Prince. To complement this activity, USAID provided funding to develop an autonomous water district to manage and maintain the water distribution system and to implement a sanitation program.

Research was conducted to help identify current water, human waste, and solid waste practices among residents. This research was used to choose technological options for the water system. In addition, the results of the research were used to suggest behavior change and community mobilization strategies to get residents to buy water from the new distribution system and to help maintain and, eventually adopt, new sanitation technologies.

Based on the request of the Sustainable Cities Initiative, GreenCOM worked in collaboration

with the Environmental Health Project (EHP) to design the research. Data were gathered by the Research Unit of the CDS.

## **RESEARCH METHOD**

- ▶ Review was conducted of recent secondary data on water and sanitation issues pertaining to Cité Soleil.
- ▶ 15 focus groups were conducted (7 with men and 8 with women) with a total of 152 participants. The groups represented:
  - residents obtaining water from different sources: a municipal water distribution system, street vendors, private water distribution shops, and beneficiaries of free water distribution program;
  - service providers: owners of water distribution points and street vendors; and
  - residents from two different flood-prone areas.
- ▶ Instruments were designed by GreenCOM in December 1995, and greatly adapted by CDS researchers. The same focus group guide was used in all groups although separate guides had been originally developed for each respondent category. Some issues were dropped either because it was perceived that the information would not be reliable if the issues were discussed in public, or because data on the same matters were already available.
- ▶ Focus group discussions were taped, transcribed, and translated from Creole to French.
- ▶ Nine of fifteen French transcripts were jointly analyzed by CDS and GreenCOM.
- ▶ A three-day workshop was held to integrate results of the qualitative research and discussions with the CDS team and obtain feedback from community leaders, particularly on how to obtain community involvement in maintaining the new water system.
- ▶ Over a four-day period, all water trucks coming into Cité Soleil were counted to estimate the amount of water brought in from the outside. Water distribution points were also identified.

## **VALUE**

- ▶ Provide basic information about the community to help identify technological options for the site.
- ▶ Determine possible constraints and motivators to technological adoption in three areas of concern: water procurement, use, and disposal.

- ▶ Demonstrate a methodology to participating NGO that can be used in future research related to other topics of concern: human and solid waste.
- ▶ Draw lessons for similar interventions in other urban slums in the developing world.

#### **STATUS**

- ▶ Research completed.

#### **KEY FINDINGS**

##### **Water Procurement, Storage, and Use:**

- ▶ On average, 203,000 gallons of water are brought in into Cité Soleil by water trucks. About 20% is distributed for free by a church.
- ▶ Water is usually purchased. The prime seller of water are the female water vendors, who go house to house. The secondary source are the reservoirs filled by water trucks. A few reservoir owners occasionally get water from a municipal distribution system (CAMEP) which may be illegally tapped. But that system is quite unreliable. Rainwater is used by some to wash clothes.
- ▶ Reservoir owners charged 1 gourde for a 7 gallon bucket whereas the mobile water vendors charge 1.5 - 2 gourdes. Mobile vendors buy the water from reservoirs or work for reservoir owners. On Sundays, water is more rare and costly (up to 3 gourdes).
- ▶ The time needed to fetch water when not purchased from street vendors ranged from 10 minutes, if a reservoir is near, to 20 or 30 minutes, when water was plentiful, to an hour or more if water were scarce. Women and children are normally in charge of fetching water. Men may get water for their own personal needs, but rarely for household needs.
- ▶ People often fight while waiting in lines at water source and must cross dangerous roads to get there.
- ▶ A six-person family uses about 42 gallons of water per day. When they do laundry, that amount doubles.
- ▶ Water is stored in buckets, metal drums, and ceramic or plastic containers.

##### **Water Purity, Treatment and Disposal:**

- ▶ Residents believe purchased water is not clean: it is not clear, has a bad smell/taste, and often has particles in it. Residents feel reservoirs are poorly constructed, near latrines or

not regularly cleaned. Residents believe that water purchased from street vendors is even less clean as buckets where it is transported are not clean and may be used for purposes other than water transportation. They believe, however, that water distributed for free is of better quality. CAMEP water is considered impure due to materials introduced to it through the illegal tapplings.

- ▶ Reservoir owners, in contrast, claim their water is clean. Mobile vendors asserted their water is clean because the reservoirs are cleaned and the reservoir proprietors provide them with screens to remove impurities.
- ▶ There is a clear perception that residents suffer from many water-borne diseases. Most participants add bleach to drinking water (to disinfect and avoid disease), and many added lemon juice (presumably for taste at least in some cases), with a number adding both.
- ▶ Water used to rinse laundry is frequently reused: to take a bath, to clean the house, to wash shoes, or minimize dust in the home or street.
- ▶ Used water that is not saved for reuse is thrown out in front of the house, in nearby canals, or around the neighborhood. This is believed to cause problems: stagnant water attracting flies and mosquitos which can lead to diseases such as malaria, skin problems, and fever.
- ▶ Other diseases were perceived to derive from dirty dishwater -- vertigo, itching, and irritation of skin on the soles of the feet.

### **Disposal of Human Waste**

- ▶ Of the 540 Cité Soleil residents interviewed in a CDS Satisfaction Study conducted in 1995, 41% reported having a latrine in the home. 59% either pay to use the neighbors' latrines or simply defecate or urinate in town wherever they are, or put human waste on the roof. Open defecation in public areas by children was observed.

### **Perceptions Regarding Public Showers and Laundry Facilities**

- ▶ The construction of public showers was well received, and many would pay a reasonable amount to use them. In fact, some store owners have constructed showers next to their shops and rent them. Advantages of public showers: more water available at home for other purposes and less mud in front of the house.
- ▶ Residents suggested building several public showers in different places with multiple shower heads to avoid long waits. Public showers are likely to be used more by men and children. Women would like to use them if they offer enough privacy, but not in the

evening.

- ▶ No public laundry facilities are known, although one existed in the past. The reaction to the idea of a public laundry was quite positive. The expectation was that they would pay a small sum and have access to unlimited water.
- ▶ Questions about public toilets were unfortunately eliminated from the final discussion guide used in the focus groups.

### **New Water System and Community Involvement in Managing and Maintaining It**

- ▶ The idea of a company to distribute water in Cité Soleil was accepted as everyone could find good water (disease-free) at a moderate price. Participants prefer that the company be private, unlike CAMEP.
- ▶ Participants asserted that the names of those persons in charge of different structures (e.g., showers, laundry facilities, fountains) should be well-publicized so residents know who to contact to resolve any problems (observed illegal tapping or closed fountain).
- ▶ The strategy for community involvement in the protection and maintenance of the system as proposed by community members would be as follows:
  - Organize a five-member Neighborhood Fountain Committee to manage each fountain, and seven Zonal Committees (one for each zone in Cité Soleil) to act as liaisons between the Water Company and the Fountain Committees.
  - Members of the local Fountain Committee will be elected by local residents; at least 2 members must be women. Selection of candidates, at a public meeting, should be based on willingness to work as volunteers, respect in the community, reputation for honesty, and ability to meet once a week.
- ▶ The Fountain Committee must select fountain operators to whom they report.
- ▶ Zonal Committees will be composed of one delegate named by each Fountain Committee and 5 advisors chosen by the District and approved by the Fountain Committee delegates. Five members should be women.
- ▶ Long-term effectiveness of the Fountain and Zonal Committees will depend on integrating some financial remuneration into the system. At the outset, however, to encourage the selection of disinterested, service-oriented community volunteers, it is recommended that no mention of any type of payment be made. However, the seven Zonal Coordinators will be full-time paid employees.

- ▶ CDS proposed using established neighborhood business people (vendors) to sell tickets for water at a small (5%) profit. This would divide responsibility for overall operation of each fountain between the fountain operator, the Fountain Committee, and the ticket vendors. Cash will be exchanged only between vendors and District accountants. Vendors will be completely responsible for any stolen or lost tickets.

### **Reactions from the Reservoir Owners and Mobile Water Sellers**

- ▶ A few reservoir owners mentioned that the new water system would reduce their income, but most were not worried. Most thought water would be delivered into the home. Some reservoir owners think that they will continue to be in business. Water at the fountains to be installed is likely to be sold at a lower price than what they are currently paying. Thus, they could have the street vendors working for them buy water at the fountains and continue to distribute to the household for a profit.
- ▶ The mobile water vendors were very concerned that the new water system would affect their ability to work in Cité Soleil and would force them to find other employment. Many do not live in Cité Soleil and felt the residents do not treat them well in general.

### **Program Implications**

- ▶ The new water system may not satisfy all the water needs of residents. Water will continue to be brought in by trucks. The price of the water to be distributed through the new system should be at least as high as that of the water sold at water reservoirs.
- ▶ Public showers and laundry facilities are acceptable technologies for the population.
- ▶ Incorporate suggestions made by residents concerning the management and the maintenance of the system to the overall plan of the new water district.
- ▶ Potential general topics for a promotional campaign are:
  - Functioning of the new system (fountains/public showers/laundry facilities)
  - Safety of water to be provided by the new system.
  - Ways to store water at home to preserve safety.
  - Involvement of community in the maintenance of the new water system.
  - Implications of new water system for reservoir owners and street vendors.

**APPLIED RESEARCH SUMMARY**

**MIDDLE EAST**

**WATER CONSERVATION AWARENESS CAMPAIGN**

**FORMATIVE RESEARCH STUDY**

February 1997

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**PURPOSE**

In support of USAID's strategic objective to conserve sustainable living resources:

- ▶ To identify a list of Best Practices pertaining to household water conservation in seven sites: Jordan, West Bank, Israel, Egypt, Oman, Tunisia and Morocco.
- ▶ To understand the part that gender plays with respect to roles around water at the household level.
- ▶ To help design a regional communication strategy to:
  - Increase public awareness of selected regional Best Practices around efficient use of water;
  - Increase awareness of the activities and existence of the Water Working Group in the region.

**BACKGROUND**

In support of the Middle East Peace Process, the State Department has requested USAID assistance in the development of a Regional Public Awareness and Education Program on water conservation practices in the Middle East. This initiative falls under the aegis of the Multilateral Working Group on Water Resources, one of the five different Working Groups in the region.

USAID, through the Environmental Education and Communication Project (GreenCOM) will conduct research in each site to generate the possible content of the Regional Public Awareness and Education Program. Findings of the research conducted will be discussed a technical meeting that will bring together experts and representatives from each one of the sites plus the United States and other non-regional parties. Based on the conclusions of the discussions, a draft communication strategy will be submitted to the State Department for approval.

“Best Practices” are defined as:

*Existing programs or initiatives promoting/permitting efficient water use at the household level that: have a track record of success; are being implemented by public or private organizations; and that local authorities at each site agree they would like to share with other countries in the Middle East region to help foster regional cooperation around water issues.*

The project will “focus on the positive” by documenting Best Practices Programs already established in each site and promoting them regionally. The communication strategy will promote water efficiency while recognizing that water scarcity is an age-old problem.

## RESEARCH METHOD

- ▶ Desk-top study, including site visits to Tunisia and Morocco, on domestic and agricultural water conservation practices during antiquity.
- ▶ Case studies of Best Practice or programs influencing efficient water use at the household level implemented over the last 20 years. To develop the case studies, consultants in each site will:
  - determine which institutions have implemented household water efficiency/water conservation programs in that period of time;
  - review documentation about those programs and elaborate research questions that must be answered;
  - develop a mini-research plan to answer those questions, including what programs to visit, what issues to address during those visits, who to interview about those interventions, what questions to ask those interviewed, and what observations will supplement the information. Multiple sources of evidence will be sought to validate the information.

## VALUE

- ▶ Identifies Best Practices around water conservation in each site to share with the Middle East region as a whole.
- ▶ Regional communication campaign is intended not only to raise awareness about water conservation practices and the Water Working Group, but also to promote increased cooperation and goodwill among countries participating in the Middle East Peace Process.
- Will contribute to the design of a regional communication strategy and impact the selection of the target populations and messages. Will provide insights that technicians can use to address real delivery, communication, and management questions in ways that are focused and productive.

## STATUS

- ▶ Antiquities research completed.
- ▶ Consultants to conduct the research on Modern Best Practices identified and submitted for approval.

## RESEARCH FINDINGS

### Antiquity

Best domestic water practices were identified for all sites, including the following prominent examples:

**Israel:** At Ceasarea Maritima, originally a Roman site on the coast of present-day Israel, public areas siphoned water from two aqueducts and houses drew water from private cisterns. An intricate, plaster-lined sewer system, which was flushed by sea action, served residents.

**West Bank:** Excavations at Jericho, Khirbet Bir Zeit, and Jenin may reveal systems similar to those in Israel. Nablus, Tell Balatah, and Samaria/Sebaste parallel Ceasarea Maritima in their dependence on cisterns for domestic water supplies.

**Jordan:** In northwestern Jordan, in the “trichora” cities, there is evidence of covered aqueducts and bedrock-cut channels that tapped the water table. At Capitolias, rain run-off channels fed large, perhaps regulated, cisterns. Gerasa had a waste water system. In southern Jordan at Madaba, covered channels ran down the center of paved streets to cisterns and reservoirs. At Umm al-Jamil in the steppic region, sheltered cisterns and reservoirs augmented domestic cisterns. At Petra, a World Heritage site, dams led water to large cisterns and catchment areas. Rock-cut channels along the wadis can be studied by today’s casual tourist.

**Oman:** Before the introduction of the *falaj/qanat* system by the Persians, Oman was probably served hydrologically by wells and channels. The *falaj* is a complicated system that collects water in wells, filters it through gravel, and then sends it by gravity through tunnels and some open canals to irrigate terraces and satisfy domestic needs.

**Egypt:** Egypt’s dependence on the Nile River for irrigation waters is well-documented. Domestically, water needs were met by wells; gardens were maintained by the basin, quasi-cistern system. Ancient Egyptians drew water from wells by using a ramp until they developed the *shaduf*, a pole with a counterweight at one end and a bucket to lift water at the other.

**Tunisia:** At Bulla Regia, near the Algerian border, abundant water supplied private baths and fountains. Each house had a cistern to collect and store rainwater in addition to wells for drinking water. Open patios on the lower levels of houses collected rainwater. Residents built underground passages to public wells. Canals transported used water from baths, toilets, and public fountains out of the city. Residents recycled private fountain water for cleaning and non-potable uses.

**Morocco:** Fez, like Bulla Regia in Tunisia, was rich in water. An underground canal system, or *repartitieur*, supplied many houses with running water. Canals of differing widths regulated water according to purpose, and gates divided new from used water, which was deposited away from city walls. Drinking water came largely from underground springs.

**APPLIED RESEARCH SUMMARY**

**MOROCCO**

**FILLING GAPS TO DESIGN AN IMPROVED WASTE COLLECTION SYSTEM**

February 1997

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**PURPOSE**

In support of USAID's objective of sustainable urbanization:

- ▶ estimate the volume of waste that is collected by the municipal waste collection system in two neighborhoods outside the city of Fez (Zouagha Haut and Zouagha Bas);
- ▶ determine the complementarity of different waste collection chains in these neighborhoods;
- ▶ determine the saliency of waste collection as a problem for residents;
- ▶ explore the waste disposal practices at the household level including responsibilities of both men and women;
- ▶ explore the perceptions of residents about paying waste collectors working for neighborhood associations, including reasons for accepting and/or refusing payment;
- ▶ ask residents what improvements need to be made to the waste collection system in their neighborhoods;
- ▶ identify the constraints faced by waste collectors to perform their responsibilities.

**BACKGROUND**

USAID is concerned with exploring alternatives to promote sustainable urban development in Morocco and has focused its activities in the city of Fez. One of those activities includes the strengthening of civil society and the development of partnerships between residents and local governments to solve salient urban problems. A parliamentarian from Fez, a strong supporter of

the same urban development objectives, identified waste as the issue to be solved and proposed that the exercise in partnership development take place in the Municipality of Zouagha, outside of Fez, with an emphasis in two peri-urban settlements: Zouagha Haut and Zouagha Bas. These are neighborhoods previously considered rural but recently incorporated to the urban perimeter due to a new redefinition of boundaries. Consequently, they are neighborhoods where the municipal government needs to extend basic services, including waste collection. These services have been initiated but are considered to be deficient, particularly by residents. Neighborhood associations have developed in the two settlements. One of their objectives is to help solve the waste collection problem. Because two stakeholders, residents and municipal government, are trying to tackle the same problem, it was considered important to bring them together to a workshop to have roundtable discussions and agree upon a common strategy. The workshop participants included: a representative of the executive branch of government, the parliamentarian from Fez, elected municipal officials, technicians from the municipality and other government institutions in charge of urban problems, and representatives of the neighborhood associations. The process included a research activity to fill the information gaps identified in the discussions and to bring to the table the point of view of other stakeholders not invited to the workshop: local officials of Ministry of the Interior ("autorite locale"), women, and waste collectors.

## **RESEARCH METHOD**

Four research teams were organized to: (1) explore the support that local representatives of the Ministry of the Interior would give to a potential partnership between the municipality and neighborhood associations as well as the role that they could play in improving the waste collection system in Zouagha Haut and Zouagha Bas; (2) collect and analyze secondary data to estimate the amount of waste collected by the municipality, understand how the municipality has organized its waste collection activities in the neighborhoods of interest, and develop a map of how different collection chains overlap in those neighborhoods; (3) explore the problems confronted by waste collectors from the municipality and the neighborhood associations to do their job; and (4) explore the beliefs, attitudes, and waste disposal practices of residents, particularly women. Each team identified the research questions to be answered and developed the instruments needed to collect the information. In-depth interviews were done of local representatives of the Ministry of the Interior and focus group discussions were organized with residents and waste collectors. Workshop participants either led interviews or worked as rapporteurs of data collected, particularly in the case of focus group discussions. Each team synthesized their findings and presented to the workshop participants in a plenary.

## **STATUS**

Completed as of September 1996.

## KEY FINDINGS

### Collection Chains

There are five waste collection chains:

- 1) household -> compactor -> landfill
- 2) household -> garbage bins -> compactor -> landfill
- 3) household -> garbage collector -> garbage bins -> compactor -> landfill
- 4) household -> wagon -> container -> compactor -> landfill
- 5) household -> illegal dump site

In Zouagha Haut, based on a map constructed by the neighborhood association in collaboration with the waste collector, only 6.3% of households use the first chain presented above, 8% use the second, 44% use the third, and 43% most likely dump their waste in illegal dump sites.

### Municipal Waste Collection System

Problems of the municipal waste collection system can be grouped into two categories: physical inputs (*matériel*) and administrative.

Regarding inputs,

- ▶ there is no truck maintenance pit in the municipal garage;
- ▶ the trucks used by the municipality are either too large or too heavy to travel the narrow and unpaved streets of squatter settlements;
- ▶ waste bins placed throughout the neighborhoods are either too small for the amount of waste generated in the neighborhoods or are not covered; they help to attract vectors (e.g., mice, flies, and mosquitoes), emanate offensive odors, and make it easy for children to play with waste;
- ▶ human resources involved in waste collection are insufficient to get the job done properly and are poorly motivated (personnel gets half of the official minimum wage, are not fully covered for illnesses that are job related, and are not provided with transportation to work despite the fact that they have to be on the job early when public transportation is not available).

Administratively,

- ▶ absence of a preventive maintenance system for trucks;
- ▶ inefficient distribution of field personnel;
- ▶ no fixed itineraries to collect waste from households;
- ▶ poor municipal waste collection forces residents to pay collectors hired by neighborhood association; this is seen as double taxation as residents already pay a mandatory waste collection fee to the municipality.

## **Neighborhood Associations**

Women are paying waste collectors, yet they are not association members. Women often do not know that waste collectors work for the neighborhood association. Thus the associations are poorly known throughout the neighborhoods.

Waste collectors are unpolite and/or refuse to collect waste when there is a short delay in paying the waste collection fee.

Good records of who pays and who does not are not kept. Waste collectors may come more than once in the same month to collect the waste collection fee.

The number of households that pay waste collectors varies too much from month to month, making it difficult for the association to pay a regular monthly salary to waste collectors.

## **PROGRAM IMPLICATIONS**

Research findings were discussed and an action plan was elaborated that deliberately included a mechanism to institutionalize the stakeholder dialogue begun at the workshop. The action plan has five major components:

- ▶ project management,
- ▶ improvement of the collection system,
- ▶ reinforcement of the structures of civil society,
- ▶ communication and education, and
- ▶ evaluation and follow-up.

Project management refers to the creation of a working committee to coordinate the different actions to be undertaken. That working committee will include representatives from all the stakeholders present in the workshop: residents, elected municipal officials, and officials from the Ministry of the Interior. A female social promoter and a local project advisor will also be members of this committee.

The component dealing with the improvement of the collection system includes actions such as:

- ▶ improvement of transfer points,
- ▶ revision of routes and schedules,
- ▶ revision of personnel distribution and improvement of working conditions for trash collectors, maintenance and improvements of collection bins,
- ▶ management of vehicles, and
- ▶ training for personnel in charge of trash collection trucks and equipment.

The component dealing with the reinforcement of the structures of civil society includes:

- ▶ the creation of a position to manage social promotion among women within the municipality to develop programs and activities enhancing women's contribution to decision-making in programs affecting the community.
- ▶ the training of members of the neighborhood associations in communication, leadership, management and planning, and
- ▶ the funding of certain actions that neighborhood associations can quickly implement.

The communication and education component includes:

- ▶ the development of social networks for women and training for women in development issues
- ▶ the creation of a position of communication/education officer within the municipality to develop the communication/education activities and to serve as a liaison with the media and companies that may produce educational materials.

Improvement of tax collections to allow the municipality to raise enough funds to improve the garbage collection system was also discussed.

Since the workshop was held, a steering committee was formed and met twice. The actions included in the Action Plan have been prioritized with a focus on improving transfer points, the conversion of illegal dump sites into green areas, and hiring more waste collectors paid with municipal funds thus lifting a ban on new employees. In addition, two cleaning campaigns have been conducted. One sponsored by the neighborhood associations and one sponsored by the municipality. Through these efforts, streets and illegal dump sites were cleaned. Neighborhood associations have asked residents to report those found throwing waste in the newly clean areas, and some residents have been summoned by the municipality as a result of those reports.

**APPLIED RESEARCH SUMMARY**

**NEPAL**

**USING VIDEO FOR COMMUNITY FORESTRY**

**FORMATIVE RESEARCH**

February 1997

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**PURPOSE**

In support of USAID's strategic objective to conserve sustainable living resources, this project is intended to:

- ▶ Stimulate discussion around, and enhance community understanding of, the new national forest policy; the community's role in implementing it, and opportunities created by the new policy;
- ▶ Support the forestry conservation extension work of the Ministry of Forests and Soil Conservation (MOFSC), Departments of Forests (DOF), Soil Conservation (DSCO), National Parks and Wildlife Conservation (DNPWC) and non-government organizations who are partners in the project.

Specific research objectives include:

- ▶ Identify appropriate priority content for videos on community forestry;
- ▶ Identify barriers to implementing the forest policy;
- ▶ Assess the impact of policy dialogue meetings at both the policy-maker and community levels by examining changes in knowledge, attitudes and behavior pertaining to the new forest policy;
- ▶ Evaluate how video can be used to promote communications, enhance learning, support community development and provide environmental education.
- ▶ Help define indicators to measure technical assistance objectives.

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## **BACKGROUND**

GreenCOM began working in Nepal in November 1996, and is providing direct assistance to the USAID/Nepal Environment and Forest Enterprise Activity (EFEA). GreenCOM plans to support implementation of national forest legislation while helping to strengthen the capacity of local field-based organizations. Video will be used as an animation tool: to mobilize CFUG members and their communities; to enhance the effectiveness of local government and NGO extension activities; and to facilitate an ongoing dialogue between community forest user groups (CFUGs) and conservation committees (CCs). Because of the extreme remoteness of the target communities in the project area, villager produced videos, or "video letters", will be used to communicate local needs to planners and policy makers at the national level. The Nepal project is a collaborative effort that requires GreenCOM itself to forge partnerships across implementors in EFEA and include other USAID sectoral activities. For example, Nepal is the only country, amongst USAID missions, with a Strategic Objective that addresses gender issues. One example of cross sectoral collaboration would be the development of post-literacy materials for women that addresses forest enterprise activities. This example illustrates the synergy that the Nepal mission wishes to see and illustrates some of the research issues that may arise.

## **RESEARCH METHOD**

- ▶ Evaluation research planned to assess the impact of the policy dialogue meetings at both the policy-maker and community level by examining changes in knowledge, attitudes and behavior. Individual interviews will be conducted with policy-makers, and group interviews (not formal focus groups) will be conducted with key informants from Community Forest User Groups (CFUGs) represented at the meetings.
- ▶ Qualitative formative research planned in several target communities to assist with the identification of appropriate priority content for videos on community forestry shot by a production firm.
- ▶ Comparative case study to understand the impact of video production by community members, using an outside production firm, on community organization skills, as well as implications for other group actions implemented by the community members.

## **VALUE**

- ▶ The research will be used to estimate changes in knowledge and behavior attributable to the intervention.

## **STATUS**

- ▶ Currently in the planning stages.

**APPLIED RESEARCH SUMMARY**

**NICARAGUA**

**INCREASING INVOLVEMENT OF BUFFER ZONE RESIDENTS IN  
SEA TURTLE EGG DISTRIBUTION PROGRAM**

February 1997

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**PURPOSE**

In support of USAID/Managua's objective to create a rational use of natural resources, which in turn should increase long-term economic sustainability and benefits to local communities. More specifically:

- ▶ Increase conservation activities in buffer zone communities.
- ▶ Develop, implement, and evaluate buffer zone EE&C strategies.
- ▶ Strengthen EE&C competency of the protected areas staff of the Ministry of the Environment and the staff of NGO's.

Specific objectives of the activity are:

- ▶ To identify behaviors that will increase involvement of residents in the turtle egg distribution system in order to reduce corruption;
- ▶ To identify the factors that facilitate and hinder these behaviors;
- ▶ To obtain suggestions about how the distribution system must be changed;
- ▶ To improve the relationship between community residents and their leadership.

**BACKGROUND**

Stakeholders have expressed interest to work with the buffer zone communities around La Flor Wildlife Refuge. This area represents diverse challenges: protecting an endangered species (the Olive Ridley sea turtle), enabling community use of wildlife resources (sea turtle eggs), and improving interactions between community leadership and the government management agency for the refuge.

There is general recognition that the guiding policy for distributing sea turtle eggs to buffer zone communities is controversial. There is a difference of opinion between sea turtle conservation biologists and resource management agencies about the impacts of egg extraction. While the former argue that no extraction should take place, the Division of Protected Parks within the Ministry of the Environment believes that buffer zone communities are entitled to have access to turtle eggs. The current system distributes 20% of the eggs laid on the La Flor beach during the

large turtle arrivals between July and February. The argument behind the program is that 20% of the eggs would be lost in any case due to natural causes such as turtles nesting on existing nests, beach erosion, etc. Poachers actively work during this season. All of the turtle eggs may be harvested legally during the rest of the year, the dry season. During that period of time, because of climatic conditions, turtle eggs have much less chances of hatching.

GreenCOM recognizes that is probably not feasible to attempt to change policies in the amount of time the project has to address this issue. Therefore, GreenCOM will work within the current system and look for opportunities in which education and communication can improve the system. Field visits indicated that community residents complain about corruption in the distribution system in general. If the distribution system were to be more transparent and less corrupt, turtle egg poaching by community members may be reduced.

### RESEARCH METHOD

A 2x2x2 design will be used to frame the study. The factors are: involvement in the operations of community commissions, proclivity to sell the turtle eggs distributed by MARENA, and gender.

This design is based on the following premises:

- ▶ Residents following more closely the way community commissions operate are likely to be less tolerant of corruption and more demanding of a transparent egg distribution system.
- ▶ Turtle egg poaching is likely to be more common among families which generally sell the turtle eggs distributed by MARENA than among those that tend to use them as a food source.
- ▶ Men and women may have different perceptions about how to reduce corruption and will play different roles in the egg extraction/use process.

In-depth interviews will be held with a minimum of five residents who have at least one dependent in each of the cells of design. Specific issues to be investigated include:

- Length of participation in turtle egg distribution program
- Participation in the election of community commissioners
- Factors that have facilitated and hindered this participation
- Support provided to the work of community commissioners
- Factors that have facilitated and hindered this support
- Other actions that can be undertaken by community residents to follow-up the work of commissioners in the egg distribution program.
- Factors that may facilitate and hinder the adoption of those actions.
- General opinions about how the way the egg distribution operates.
- Ways in which that operation may be improved.
- Use of eggs distributed.
- To whom are eggs are sold, who in the family performs the tasks and keeps the profits.
- Egg harvesting practices in the dry and wet seasons.

Knowledge about nesting practices of turtles and turtle biology.  
Knowledge of rationale behind and basic characteristics of the egg distribution program.

#### VALUE

- ▶ Develop an example of audience analysis research that can be used in one the workshops to train park rangers and NGO staff members in how to develop EE&C interventions.
- ▶ Generate data to help design an educational intervention and provide general guidelines for setting up an evaluation of that intervention.
- ▶ Obtain information about ways in which the egg distribution system can be improved and generate a dialogue between community residents and MARENA about further participation of communities in managing the resource.

#### STATUS

- ▶ Bidding process for research firms to conduct the study initiated.
- ▶ Expected completion, March, 1997.

**APPLIED RESEARCH SUMMARY**

**NICARAGUA**

**PROFILES OF PARK VISITORS, ACTUAL AND POTENTIAL**

February 1997

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**PURPOSE**

In support of the following USAID/Managua objectives:

- ▶ Develop, implement, and evaluate environmental interpretation in protected areas.
- ▶ Strengthen EE&C competency of the protected areas staff of the Ministry of the Environment and Natural Resources and the staff of NGO's.

Specific objectives are:

- ▶ To characterize visitors to Volcan Masaya National Park, understand their unmet educational interests, and evaluate their satisfaction with services provided as the new interpretative strategy is implemented; and
- ▶ To describe the potential ecotourism visitors to other protected areas included in the Minimal Park System (Juan Venado and Zapatera National Parks, Mombacho Forest Reserve, La Flor and Chacocente Wildlife Refuges, and Miraflor and Cosiguina Protected Areas).

**BACKGROUND**

There is a strong interest on the part of USAID and the Ministry of the Environment and Natural Resources (MARENA) to increase coordination with private sector companies in the management of protected areas. Recently an agreement was signed between MARENA and a national foundation releasing management responsibilities for Mombacho Natural Reserve to the foundation. With this issue of private management comes an interest in client satisfaction, the development of ecotourism opportunities that will help pay for protected area management, and improvements in protected area management through increased environmental education and interpretation around management issues.

Volcan Masaya National Park is the most developed and well-visited park in Nicaragua. It is reported to have one of the highest rates of visitation in the region (greater than parks in Costa Rica). The park receives many national and international visitors as well as school children who participate in environmental education programs at the park.

Currently, the park is undergoing improvements in infrastructure and park personnel training in environmental education and interpretation. The Visitors Study in Volcan Masaya National Park will assess park visitor satisfaction before and after some of these changes are implemented. In this way, MARENA will be able to have a baseline of information about visitor needs and interests as well as evaluate the effectiveness of the changes (for example, improved interpretive services) on visitor satisfaction.

While Volcan Masaya has well-established clientele of visitors, many other protected areas in Nicaragua have the potential to benefit from ecotourism. Areas such as Mombacho Natural Reserve, Juan Venado Natural Reserve, and La Flor Wildlife Refuge offer a diverse range of natural settings and experiences within easy travel distance from Managua. A study of the ecotourism market will provide useful information to private sector tourism companies for improving their services; to private sector groups involved in protected area management; and to MARENA for increased awareness of how ecotourism can be developed to support conservation management.

## **METHOD**

The study of visitors to Volcan Masaya National Park will be done through a survey that will sample the three major categories of visitors to the park: students, national, and international visitors. Data will be collected during times of highest visitation over a 12-month period. The main topics to be covered in the survey will deal with issues such as: what brought visitors to the park, expectations, awareness of the activities available in the park, activities selected during the visits, reasons for making that selection, satisfaction with existing interpretive services and materials, and suggestions for improvements. Participants will also be asked about their park visitation experience in general, and the motivations behind previous and/or future visits trips.

The study to describe the potential ecotourism market will have two components. One will be a survey of formal tour companies, informal sector of guides, and other service providers. The survey will quantify: the tours available, the sites that are targeted by these tours, the characteristics of the clientele, level of demand for these tours, perspectives on how the tours were developed and changed over time, modifications introduced to increase client satisfaction and demand, and environmental topics and messages addressed. The second component will be a survey of clients of these tour operators. Information to be gathered will include: extent to which tour expectations were met, educational accomplishments of the tours, both educational and service modifications to be made to the tours, and willingness to visit other sites.

## VALUE

- ▶ Generate data to help design an educational program and provide general guidelines for setting up an evaluation of that program.
- ▶ Provide information to park managers on how to develop the parks' image and attract more visitors.

## STATUS

- ▶ Scopes of work under preparation.

In process—expected completion June, 1997.

**APPLIED RESEARCH SUMMARY**

**THE PHILIPPINES  
FORMATIVE RESEARCH IN SUPPORT OF PILOT ENVIRONMENTAL  
CAMPAIGNS**

February 1997

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**PURPOSE**

In connection with USAID's strategic objective "to conserve sustainable living resources", the research described below has the following purposes:

- ▶ To identify environmentally friendly behaviors that can support the process of devolving natural resource management to local governments and communities;
- ▶ To identify internal and external factors that facilitate the adoption of those behaviors; and
- ▶ To help conceptualize the major themes to be addressed in a pilot communication campaign to be implemented in San Vicente, Cebu and Mindanao del Sur.

**BACKGROUND**

GreenCOM is supporting the implementation of the Local Government Code. This Code devolves natural resource management from the national to the local level. It provides the mandate and window of opportunity to motivate and assist communities to take the actions necessary for sustainable resource management within the different administrative divisions at the local level: municipalities, barangays and puroks.

GreenCOM's objective is to design three pilot campaigns that can help heat up the devolution process at the "top" (provincial and local government officials) and at the "bottom" (leaders of People's Organizations and individual community residents). GreenCOM has three mandated sites in the Philippines for the implementation of the pilot campaigns located in different parts of the country: San Vicente in Palawan, Cebu/Olango in the Visayas, and Malalag in Davao del Sur.

Formative research to help design the campaigns was carried out in two stages. During the first stage, research firms were hired to examine what environmentally friendly actions are being carried out by different stakeholders and the factors that motivate them to perform these actions. During the second stage, research findings were discussed and expanded at a national workshop and regional workshops at each one of the sites. For this purpose, participants in regional workshops were grouped into three major categories: local government officials and central government agencies,

People's Organizations and NGO's, and community leaders and residents.

## **METHOD**

During the first stage of the formative research, a 3x2x2 design was used to guide the data collection activity. The factors in this design were:

- ▶ level of respondent (official of local government units (LGU's), community leaders, and community residents);
- ▶ involvement in environmental actions (more or less active); and
- ▶ gender (male or female).

LGU officials classified as more actively involved in environmental matters generally came from the only administrative unit in the mandated sites where environmental actions were undertaken. Within that LGU, there may have been several settlements. The local leaders and community residents in the study came from settlements with above average demographic densities for the site as a whole. In some sites, as environmental issues addressed may vary, two types of communities were visited: coastal and upland. While LGU officials and community leaders were generally interviewed through individual in-depth interviews, community residents participated in focus group discussions.

Factors considered as internal behavioral determinants included: perceived consequences of the actions undertaken, perceived social norms, values and beliefs about the environment, perceptions about the status of the natural resource base, knowledge about environmental policies and laws, etc. Factors considered as external behavioral determinants included: administrative and political histories of involved officials, policies and regulations, access to appropriate technologies and financing to adopt them, etc.

At the regional workshops, the three represented groups (local and central government officials, PO's and NGO's representatives, and local residents) were asked to validate research findings and were engaged in several activities to:

- ▶ determine what environmentally friendly and unfriendly activity/behaviors they had been engaged in in the past, were engaged in currently and could be engaged in the future;
- ▶ select one priority activity/behavior which they would focus on in the future activities (whether practiced in the past or not);
- ▶ identify encouraging and discouraging factors to perform that activity/behavior;
- ▶ select themes for possible messages to be included in the pilot campaigns;
- ▶ identify channels through which those themes could be disseminated; and
- ▶ determine indicators to measure the success of the pilot campaigns.

## **VALUE**

Develop the content of three communication campaigns and engage stakeholders in the process of identifying it.

## MAJOR FINDINGS

The following chart summarizes the environmentally friendly actions identified by the different stakeholders in each site. The chart includes past, present and future activities.

	Palawan	Cebu/Olango	Malalag
Government Officials	<ul style="list-style-type: none"> <li>- Reforest mangroves</li> <li>- Reforest the uplands</li> <li>- Support for fruit free farming</li> <li>- Allocate funds for barangay nursery</li> <li>- Attending seminar on environmental protection management</li> <li>- Technicians employed and assigned in each barangay</li> </ul>	<ul style="list-style-type: none"> <li>- Reforest mangroves</li> <li>- Support beach patrols</li> <li>- Support construction of artificial reefs</li> <li>- Protect bird sanctuary</li> <li>- Improve waste collection system</li> <li>- Clean beaches</li> <li>- Collect dead shells</li> <li>- Construct sanitary toilets</li> <li>- Give away toilet bowls</li> </ul>	<ul style="list-style-type: none"> <li>- Revive mangrove reforestation</li> <li>- Support creation of artificial reefs</li> <li>- Hold joint session with coastal municipalities to have uniform law against illegal fishing</li> <li>- Support alternative livelihood programs (e.g., seaweed farming)</li> <li>- Protect fish sanctuary</li> <li>- Implement zero waste management program</li> </ul>
NGO's, PO's	<ul style="list-style-type: none"> <li>- Reforest mangroves</li> <li>- Patrolling against illegal fishing</li> <li>- Installing fish attracting devices (FAD's)</li> <li>- Making and installing artificial reefs</li> <li>- Gravity irrigation</li> <li>- Promoting duck raising</li> <li>- Implement cleanliness campaign</li> <li>- Attend environmental protection workshops</li> </ul>	<ul style="list-style-type: none"> <li>- Promote environmental protection</li> <li>- Promote planting of fruit trees as alternative livelihood source</li> <li>- Establish water catchment area</li> <li>- Organize fisherfolk cooperative</li> <li>- Organize multi-purpose cooperative</li> <li>- Fight for the establishment of a fish sanctuary in every coastal barangay</li> </ul>	<ul style="list-style-type: none"> <li>- Reforest mangroves</li> <li>- Seaweed cultivation</li> <li>- Sea farming</li> <li>- Coastal resource profiling</li> <li>- Hook-and-line fishing</li> <li>- Fish processing programs</li> <li>- Agro-forestry programs</li> <li>- Organic farming</li> </ul>
Residents	<ul style="list-style-type: none"> <li>- Protect fish sanctuary</li> <li>- Tree planting in Port Baron</li> <li>- Tree planting every time a birthday is celebrated - -</li> <li>- Separate organic waste</li> <li>- Make a compost pit</li> <li>- Sell natural fertilizer</li> <li>- Pay garbage collection fee regularly</li> <li>- Get more information on the environment</li> </ul>	<ul style="list-style-type: none"> <li>- Report illegal fishermen to authorities</li> <li>- Report people extracting corals to the authorities</li> <li>- Plant trees in Santa Rosa</li> </ul>	<ul style="list-style-type: none"> <li>- Create organization to fight illegal fishing</li> <li>- Protect fish sanctuary</li> <li>- Seaweed farming</li> <li>- Reforest mangroves</li> <li>- Construct common toilet</li> <li>- Clean compost pits</li> </ul>

Across sites and stakeholders, there is a concern for insuring that preservation of the environment does not limit sources of livelihood. The implementation of environmentally friendly activities and the adoption of environmentally friendly actions will often depend on the extent to which alternative sources of revenue and livelihood are being created and supported. There is also a generalized concern, particularly among residents, that there is unfair enforcement of ordinances related to environmental protection. Residents reported refraining or not becoming fully involved in environmentally friendly actions because of the favoritism with which environmental ordinances are enforced. Powerful fishermen or friends and relatives of law enforcement agents are often not being penalized for their violations.

The example below illustrates the conclusions of the process that workshop participants went through during the discussions at each site. This example is an activity that was mentioned in all three sites by community residents: protecting a fish sanctuary.

Protecting a fish sanctuary requires individuals to engage in several behaviors: joining a fisherfolk group, patrolling the boundaries of the sanctuary, reporting violators, and serving as a witness to prosecute them. The barriers to this set of behaviors include: using the fisherfolk's own resources to patrol (time, boat and gasoline), and confronting social antagonism and ostracism in communities as violators may be friends or relatives. The facilitating factors that may motivate residents to engage in these behaviors are: access to the technical assistance made available to fisherfolk groups through NGO supported programs for alternative livelihood sources for group members; creating an environment that will make it easier for fish to reproduce thus increasing fish catch; ensure a continuous source of income; and create a future source of income for the children of residents. Community residents believe that the themes to be included in messages should play on the Filipino value of taking risks in the present to prepare the future. Indicators developed by community residents to measure the impact of educational interventions to promote the protection of fish sanctuaries include mainly increases in fish catch or income resulting from fishing.

#### **PROGRAM IMPLICATIONS**

Data still going under analysis to design pilot campaigns.

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